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A Century of Progress in Nutrition
Clive M. McCay and E. Neige Todhunter

Studies of the Protein Requirements of Women
Margaret A. Ohlson, et al.

Observations Concerning the Post-Operative Diet
Florence C. Schmidt

Terminal Heating of Infant Formula. I. Bacteriological Investigation of Low-Pressure Technique
F. R. Smith, R. D. Finley, H. J. Wright, and E. A. Louder

Terminal Heating of Infant Formula. II. Bacteriological Investigation of High-Pressure Technique
R. D. Finley, F. R. Smith, and E. A. Louder

Epidemiological Aspects of Amoebiasis
Raymond L. Laird

Nutritive Value of Cooked, Immature and Mature Cowpeas
Mary S. Eheart and Mattie Lou Sholes

Reorganization and Constitution

On to Boston

Chart on Reorganization

New Staff Appointment for Association Office

An Introductory Reading List on History of Nutrition

The Teaching of Nutrition in Schools of Medicine

A Nutrition Clinic for Medical Students

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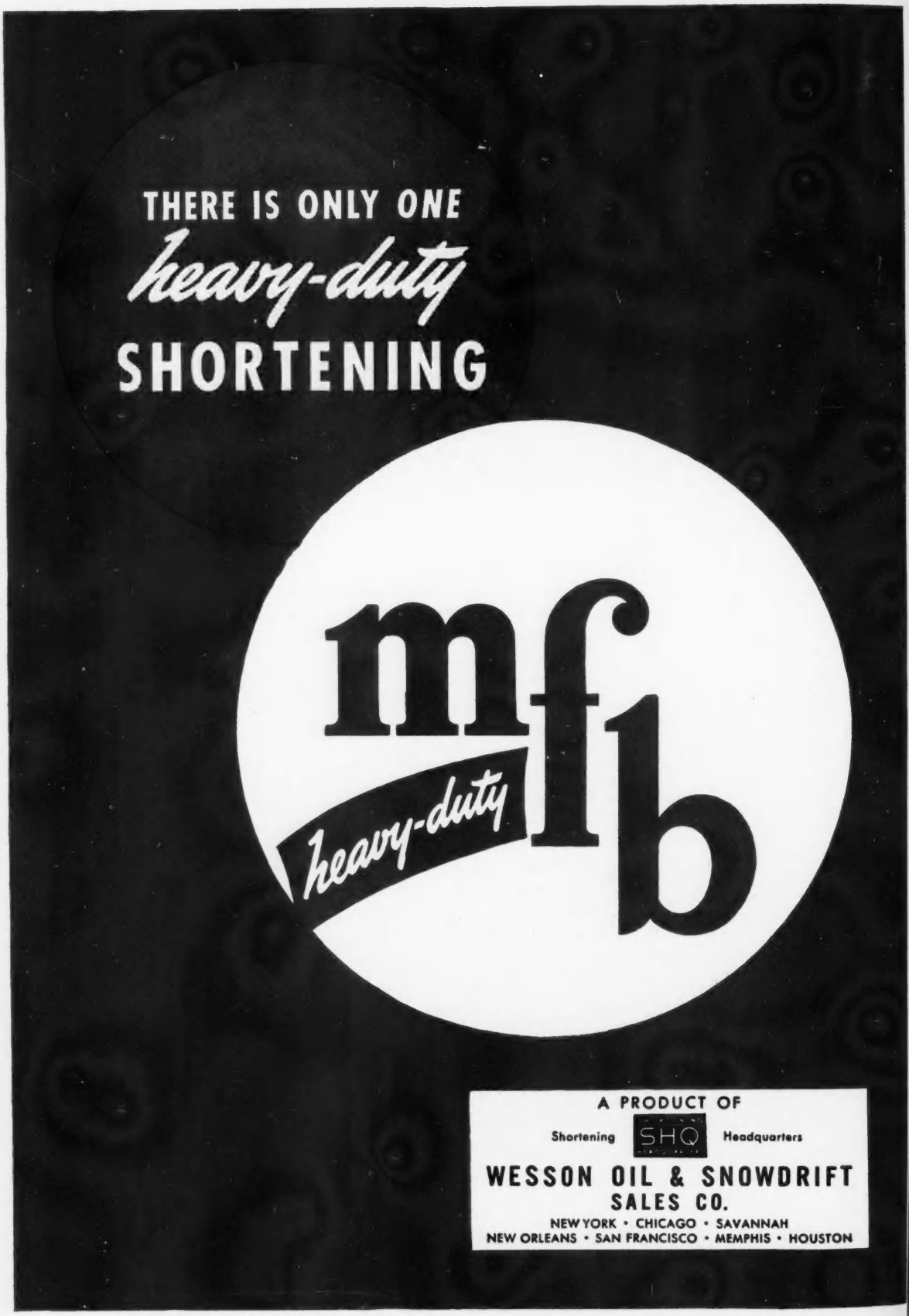
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A Century of Progress in Nutrition

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Prepared in recognition of the centennial celebration, 1848–1948, of the American Association for the Advancement of Science, of which the American Dietetic Association is an affiliated society

HISTORIANS in the year 4000 may describe the year 1848 as the turning point for our civilization. At that date many men considered seriously the formation of a United States of Europe with a truly democratic government, socialized industries, and free trade. Such an organization might well have made escape possible from two destructive world wars, and science might have advanced more rapidly. There is no reason, however, for believing that social organization could have kept pace. Men might merely have found themselves, a few decades earlier, thwarted by the great modern problems, such as 10 million aged in the United States with little provision to care for them, by radios blaring moronic noise night and day, by patients with degenerative diseases filling hospital beds, and by nearly 1 per cent of the population confined to mental hospitals, prisons, and other institutions.

In 1848 our nation was preparing to plunge into a destructive civil war. Conditions in Europe at that date have been summarized by Hazen (1): "Central Europe at the opening of 1848 was in a restless, disturbed, expectant state. Everywhere men were wearied with the old order and demanding change. The French revolution of 1848 was the signal for the most far reaching disturbance of the century. . . . The great mid-century uprising of the people had begun the most widespread convulsion Europe was destined to know until 1914."

Perhaps the same atmosphere that led to the social unrest at the middle of the nineteenth century was responsible for the substantial progress made in nutrition and other sciences during this same period.

EARLY WORKERS IN NUTRITION BEFORE 1848

Since most of the men responsible for these advances were still alive in 1848, let us create in our imagination an international nutrition congress. Such a meeting can be superior to a contemporary one, since the scientists selected can be chosen on the basis of creative work which has been tested by more than a century of usefulness. This congress might well have been held in Paris, for French science was approaching its zenith in the field of physiology. The following list of those invited to attend and the major conclusions of their reports indicate the status of nutrition in 1848.

Francois Magendie, sixty-five, was the most illustrious of the nutritionists. His great report of the gelatin commission, 1841, had laid the basis for modern knowledge of both vitamins and essential amino acids.

Michel Chevreul, sixty-two, only a little past middle life and destined to live to the age of 103, had given the world his great book on lipids in 1823. This book can still be read with profit.

Claude Bernard, thirty-five, had just completed his study of the function of the pancreatic juice in the splitting of fats. Ahead of him, before his death in 1878, lay fertile years of teaching and research.

J. B. Boussingault, forty-six, had told the world a quarter of a century earlier, how to prevent goiter by the use of iodized salt. Excessive use of iodine for this purpose was to throw this discovery into disrepute and to cause mass suffering for the next half century. In 1845 had appeared his great nutrition work concealed under the title of *Rural Economy*.

J. B. A. Dumas, forty-eight, teacher of Barral, co-author of *Essai de Statique Chimique des Etres Organises*, and called by Liebig, "the French Gasbag," would probably have been busy outside the doors of the meetings getting himself elected president of the next congress.

Many other French scientists could have made substantial contributions to this congress, such as A. Payen, fifty-three, who isolated and named cellulose, converted starch to dextrin commercially, and later, in 1854, wrote a text on food chemistry.

From the small surrounding nations would certainly have come other outstanding men.

Charles J. Chossat, fifty-two, practicing physician in Genf, would have been in attendance. His great study which won the prize of 1840 proved that wheat and water must be supplemented with calcium car-

bonate to develop bones in a growing pigeon. For the first time, men appreciated the importance of calcium in the diet.

Ernst von Bibra, forty-two, natural historian born in Schwebheim and died in Nurnberg, published the first of his fifteen books on chemical studies of pus in 1842, his book on bones and teeth in 1844, on coffee and substitutes in 1858, and on cereals and bread, 1860.

G. J. Mulder, forty-six, creator of the word "protein," published his huge text on biochemistry from Holland in 1843.

J. Moleschott, twenty-six, a student of Mulder was destined to write many books including one on foods and one on metabolism.

P. L. Panum, twenty-eight, fresh from his study of epidemics in the Faroe Islands, was to become a physiologist and researcher on bread.

From Giessen would have come Liebig, forty-five, then at the height of his teaching career. His *Familiar Letters on Chemistry* had appeared in 1844. He would certainly have handled all the newspaper publicity of the congress and competed with Dumas for the next presidency.

From Dorpat might have been expected F. Bidder, thirty-eight, and C. Schmidt, twenty-six, but they were very busy with their metabolism studies upon cats. These were reported in their great text, *Digestive Juices and Metabolism*, published in 1852.

Max Pettenkofer, thirty, just made professor of dietetic chemistry at Munich because he had revived the art of making a colored glass similar to one found in Pompei, had already devised his test for bile, isolated hippuric acid from the urine of a girl who ate apple peelings, and separated creatinine from urine.

The great students of digestion, F. T. Tiedemann, sixty-seven, and Leopold G. Gmelin, sixty, of Heidelberg, would certainly have attended no conference in France since they felt they had been dealt with unjustly a quarter of a century before. In 1825 the French had awarded a prize for the study of digestion to Leuret and Lassaigne for inferior work. Time has justified the German workers, and many of their discoveries have been amplified into our modern knowledge. Some of their work foreshadowed the discovery of the amino acid, tryptophan, and of vitamin K.

England would have shed luster on the congress by her famous team of nutritionists, J. B. Lawes, thirty-four, and J. H. Gilbert, thirty-one. In 1843 this famous partnership had been formed, although Lawes returned to his farm home earlier in 1834. Thus arose the famous work in agronomy and nutrition at Rothamsted. Sheep feeding trials were started in 1848 and swine feeding in 1850. These were the classical studies that were to prove that the animal body could make fat from carbohydrate.

From England might have come also Sir E. Chadwick, forty-eight, who made extensive studies of prison diets in the course of improving the public health. Even at this early date, Chadwick found the heaviest tax in favor of disease was the average expenditure of $25 made each year for alcoholic beverages by each British family.

William Prout, sixty-three, although he published no research after 1829, might well have reminded his colleagues at the congress of his thirty-four papers, of his discovery of hydrochloric acid in the gastric juice, of the use of calcium from the egg shell by the developing chick, if not of his atomic hypothesis. His famous review setting forth the hypothesis of the "proximate principles" in nutrition appeared in the three editions of the *Bridgewater Treatise* starting in 1834. The fifth and last edition of his book on the *Treatment of Calculus* appeared in 1848.

William S. Savory, just elected to the British Royal Society in 1847, might have lectured the congress from his book upon *Life and Death*, or he might have described his chemical balance studies with white rats to establish the nutritive value of meat and wheat. These studies published in 1863, as well as Voit's claim that Mortigny used rats for studies of fasting as early as 1825, indicate that the common experimental animals were in use by the middle of the nineteenth century.

Well known at the congress would have been America's delegate, William B. Beaumont, sixty-three, practicing physician from St. Louis. His famous *Experiments and Observations upon Digestion*, which appeared in 1833, established his genius among physiologists.

Finally from Sweden might have come Jons Jakob Berzelius who died in August, 1848, at the age of sixty-nine. His many years of teaching medical chemistry helped lay the foundation for the modern science of nutrition.

This completes a brief, incomplete roster of the men who established the tradition of sound research and trained the scientists for the latter half of the nineteenth century.

For the remainder of this century, Germany took the leadership in training researchers and teachers for herself and the English-speaking world. In her scientific journals appeared most of the advances in nutrition, biochemistry, and agricultural chemistry. During this same period, however, there was substantial production from England and France. The American agricultural experiment stations, founded at the close of the War Between the States, began to make substantial contributions toward the end of the century.

DEVELOPMENT OF RESEARCH TECHNIQUES

Advances in nutrition are largely conditioned by improvement in chemical or physical analytical techniques, isolation of new organic compounds, and the

development of new or improved methods in biology and physiology. All of these fields advanced in waves but at constantly accelerating rates during the past century.

In the field of biology, one of the most useful techniques involved the feeding of mixtures of purified constituents. Animal species, from micro-organisms to man, were used for such studies. To date, most advancement has probably been made from research with rats and mice, although substantial progress has resulted from the use of bacteria, insects, fish, chickens, dogs, sheep, goats, guinea pigs, rabbits, hamsters, and men.

In the *Clinical and Anatomical Studies of Diet* published in 1789, nineteen years after the death of the author, William Stark, appear his attempts to live upon a mixture of honey and flour just before his death. Early in the nineteenth century Magendie (2) attempted to maintain dogs on diets of simple constituents, such as starch and sugar. Tiedemann and Gmelin (3) attempted the same with geese. Even in America, Porcher in 1869 observed that rats infesting a rice granary were blind and that rice-eating people had much trouble with their eyes (4).

PROUT'S PROXIMATE PRINCIPLES

Prout's working hypothesis of "proximate principles" (1827) was to be challenged repeatedly during the next half century until the essential nature of certain organic compounds and inorganic elements was clearly established. Prout had stated (5) that the nutrients essential for life were the proximate principles, "the saccharine, the oily, and the albuminous."

The period ending in 1880 recognized the importance of feeding mixtures of purified ingredients to establish essentials that the animal body must derive from its food. The superb texts of the period, such as Pavy's *Treatise on Food and Dietetics* (1874) and Voit's *Physiology of Metabolism*, (1881, Vol. 6, I, Hermann's *Handbuch*), summarized failures to maintain dogs, rats, rabbits, chickens, and geese upon simplified mixtures even when the proximate principles were supplemented with inorganic elements.

In 1897 came the reports of Eijkman from Java, and thiamine was near discovery (7). Soon appeared numerous studies with pigeons, rats, and mice, such as those of J. Ludwig from Munich in 1906 (8) in which he fed pigeons mixtures containing casein, 13 per cent; starch, 80 per cent; sugar, 2 per cent; fat, 2 per cent; and ash, 2.7 per cent. In seventeen days the heads of the animals dropped to their backs. Likewise, his rats failed on similar diets. His roster of those who failed with synthetic diets might be used as a hall of fame for discoverers of vitamins. They include Plosz, Maly, Weiske, Salkowski, Zadik, Marcuse, Forster, Lunin, Socin, Hall, Abderhalden, Henriques, Hansen, and Falta. The groundwork was laid by these European workers before the turn of the century. American and British workers were soon to take over the leadership in advancing the science, as history passed into the twentieth century.

WORK WITH INORGANIC ELEMENTS

The development of knowledge concerning inorganic elements was rapid during the latter half of the nineteenth century. The basic studies of Chossat (9) and Boussingault (10) stimulated many workers to study calcium in relation to the formation of bones and teeth. Even Liebig proposed the making of bread with lime water. For the most part, however, the problems of the mid-nineteenth century were the result of too much calcium in bread because the cheap adulterant for flour of this period was calcium in the form of chalk, gypsum, bone meal, and limestone. Hence chemists, such as Accum in England, devoted much attention to exposing these additions.

In 1870, Papillon found that he could modify the composition of the bones of pigeons by feeding strontium, magnesium, and aluminum (11). Interest has grown with the extension of these studies in modern times.

After Forster's dogs and pigeons died with typical paralysis in 1879, attempts were made by several of von Bunge's students to maintain laboratory animals upon synthetic diets with salt mixtures resembling the ash of milk. Thus Lunin, in 1881 (6), failed in his attempts to keep mice upon such diets for more than a month, but found they would live much longer on dried milk.

In 1880 the English physician, Sydney Ringer, reported (12) the first of his studies upon the effects of inorganic salts upon tissues. Rising early in the morning before a busy day of visiting patients, he worked out the composition of his well known solution.

While Ringer was following his interest in one part of London, the pathologist, J. B. Sutton, was making history in the London Zoo (13). He gave attention to the common diseases among the monkeys and lions. He soon found that the familiar rickets of species could be checked by feeding bones and cod-liver oil. Before this, lions could not be reared in zoos; today they are about as cheap as pure bred dogs. More than three decades were to pass, however, before Sutton's methods of 1884 for preventing rickets in lions were to be applied for treating and preventing this disease among the children of Vienna.

The enthusiasm of von Bunge gave salt a position of importance, along with calcium during the nineteeth century. However, little attention was given to trace elements. Part of the reason for this was the contamination of purified diets with sufficient amounts so that few deficiencies were created. The

need for vitamins destroyed the animals before other shortages made themselves felt.

Although Boussingault stressed the importance of iodine early in the nineteenth century and although iron had been used since early times in the treatment of anemia, such elements were regarded as specific medicines, such as quinine. They were not regarded as essentials for animals but rather as a remedy for individuals who contracted specific diseases. Just before the turn of the century, however, this outlook started to change when iodine was found to be a part of thyroid tissue. The nutritionist of the nineteenth century paid little attention to elements, such as manganese, but left these to the interests of pharmacologists, such as Kobert.

EARLY WORK ON PROTEINS

Among the proximate principles, the fats played a very important part in the research of the nineteenth century because of the much debated claim that proteins were the source of fats in the animal body. Carbohydrates have been given inadequate attention even in modern times because of the common assumption that starches and sugars arrive at a common end, namely glucose.

Protein became a center of interest early in the nineteenth century after it was proved that nitrogen of the air could not be converted by the animal body into tissues. Before the year 1900, fourteen amino acids had been prepared in pure form and isolated from protein.

As experimental animals, the rat and dog shared the honors in the discovery of essential amino acids. Making possible this early discovery was the availability of proteins that lacked certain essential amino acids. Gelatin had been prepared by Papin in the seventeenth century. Papin also gave the world the autoclave and pressure cooker. Zein was first isolated by the American chemist, John Gorham (1783–1829) (14). Gliadin was first prepared by the Italian chemist, Taddei, in 1820 (15). Casein, the favorite protein of nutrition students for a century, was known from early times due to its precipitation during the souring of milk.

After Magendie in 1816 reported that dogs could not live upon gelatin, few attempts were made to provide a working theory until the physiologist, L. H. Hermann (1835–1888) suggested that proteins were built of amino acids, like words were made from letters. He thought that certain proteins lacked specific amino acids and, therefore, resembled incomplete words. He suggested to a Swiss physician that he test this working hypothesis.

This physician, Escher, reported in 1876 (16) that a dog fed a synthetic diet with gelatin as the protein, lost weight rapidly. However, if tyrosine were added, the loss was much slower. He found the same to be true for a pig. His studies were made between the years 1869 and 1874. This research was described in an obscure natural history journal of Zurich. From these studies came the extensive development in our knowledge today of essential amino acids.

THE TWENTIETH CENTURY

Nutrition has been called a twentieth century science, but the studies begun in the latter half of the preceding century laid a foundation for active work on the part of many investigators. Developments in chemistry and physics, and particularly in equipment and methods of analyses, made possible the rapid advances in all phases of nutrition. The increase in the number of centers of teaching and research was also a contributing factor. The first teacher of physiological chemistry in this country was Russell Chittenden (1856–1943), appointed in 1874 to the Sheffield Scientific School of Yale University. Under the able teaching of Chittenden and other Americans who had studied in the laboratories of Voit and other German scientists, leadership in nutrition investigation shifted to this country. However, it was not till 1921 that a nutrition professorship was established in any American university (17). In that year Mary Swartz Rose (1874–1941) was appointed Professor of Nutrition at Teachers College, Columbia University. Today almost every university and many industrial and private laboratories carry on nutrition research. In consequence, so rapid have been the advances and so many the workers that it is impossible here to do more than indicate a few of the steps, or name more than a handful of the investigators.

W. O. Atwater (1844–1907), a graduate of Yale University and student of Voit, began the dietary studies which continue today as a prominent phase of the work of the Bureau of Human Nutrition and Home Economics. Atwater participated in some 350 dietary studies of several thousand people in various parts of the United States. He published the first analysis of an American food, corn, and prepared the first tables of food composition in this country. For years these tables were the main source of information for nutrition workers in many countries. The studies on animal respiration, begun by Lavoisier and extended by Pettenkofer (1862) with a "man sized" respiration chamber, achieved a high degree of perfection in the Atwater-Rosa-Benedict calorimeter. This apparatus made possible an extensive series of papers on basal metabolism and total energy metabolism from many laboratories where such calorimeters were built. F. G. Benedict was also to devise the portable type of metabolism apparatus which by indirect calorimetry has made basal metabolism measurements a universal tool in medical diagnosis.

The desire for quantitative knowledge of nutritional requirements of man was carried forward by

Atwater with his "standard" diet of 100 gm. protein and 2700 calories for a man doing light work. H. C. Sherman added greatly to our knowledge of this subject. His work on food chemistry and metabolic studies led to the development of standards of nutrient requirement which, for a quarter of a century, have been the guide for the majority of workers in this field. In 1920, Sherman examined all the available literature on nitrogen balance studies on adults and recommended 44.4 gm. daily as the protein requirement of a 70-kg. man. Similarly, from a study of ninety-seven calcium balance experiments, 0.45 gm. calcium per day was considered to be the requirement. To allow a margin of safety for individual variations, a 50 per cent increase over these figures was recommended. Today, the Recommended Daily Allowances by the National Research Council, presented in 1943 and revised in 1945, vary little from those of Sherman but have been extended to include quantitative requirements for other nutrients.

RECENT WORK ON PROTEIN

The turn of the century saw the beginning of the major studies on protein in this country under the leadership of T. B. Osborne (1859–1929), later to be joined by L. B. Mendel (1872–1935). Up to 1900, energy and protein were considered the important factors in nutrition, although the need for certain minerals was recognized. As late as 1911, the situation was described by Osborne and Mendel (18): "Even today it is still common, despite the newer knowledge in the field of biochemistry, to read of the part played by proteins, fats, and carbohydrates in nutrition as if these groups of compounds were each chemically homogenous and within wide limits physiologically interchangeable." With the discovery that not proteins, but amino acids, were the products of digestion which were absorbed into the blood stream, Osborne and Mendel began their classic feeding trials with rats to determine the relative and absolute values of individual proteins. Earlier investigators had explained the growth failure of their experimental animals as being caused by monotony of the diet. Osborne and Mendel showed that this was not the case, that energy intake was not the factor, but that the efficiency of a protein depended on the minimum amount of any indispensable amino acid which it yielded. For nearly twenty years Osborne and Mendel worked on the problems of growth, especially with regard to the amino acids, but they were also pioneers in the identification (1913) of vitamins A and B.

Protein research progressed rapidly and along widely divergent lines. Protein requirement was widely disputed; the relatively low intake recommended by Russell H. Chittenden which was one-half the Voit standard and considerably below that of Atwater, has now given place to the liberal protein diet recommendations of today.

W. C. Rose of the University of Illinois began his studies on the essential amino acids in 1922 and established those which were essential for the rat and more recently for man, and now is engaged in determining the quantitative requirement by man for each of the amino acids.

Rapid indeed has been the change from protein, once thought of as a single substance, to present day studies of the amino acid components of protein, their relation to viruses, hormones, and antibodies, and their interrelations with vitamins and other dietary constituents.

STUDIES OF DEFICIENCY DISEASES

Clear-cut dietary deficiency diseases have not been common in this country in the past forty years, but two exceptions must be mentioned. In 1906 endemic pellagra was reported in the United States (19); it increased through the years to a peak mortality rate of 7793 in 1929. Improvement in food habits, based on the work of Goldberger and others, and the identification of niacin in 1937 (20) as one of the essential vitamin factors in combating the disease have reduced the death rate to practically zero.

In 1917, Marine and Kimball (21) demonstrated that simple goiter, endemic in the Great Lakes region, could be prevented by the use of iodine, and the use of iodized salt has reduced this dietary deficiency condition to a low incidence.

GROWTH OF KNOWLEDGE CONCERNING VITAMINS

Forty years ago vitamins were unknown, at least by name, although study of certain diseases through the centuries and the use of animal feeding experiments in the latter half of the nineteenth century had prepared the way. Casimir Funk in December, 1911 (22) introduced the term "vitamine," later to be modified in 1920 by Drummond (23) to "vitamin." It was Hopkin's classic paper of 1912 (24) which was the foundation for the wide acceptance of Funk's hypothesis. Quickly there followed the identification by McCollum and Davis (25) and Osborne and Mendel (26) of "fat-soluble A" and "water-soluble B." Vitamins C, D, and E were soon added to the list, and the early problem became one of measuring the amounts of vitamins present in foods without knowing what these substances were. Quantitative determinations were developed in Sherman's laboratory (27). These methods and units were the chief ones in use in this country until at the League of Nations Health Organization Conference on Vitamin Standards, London, June 17 to 20, 1931, international units, standards, and methods of preparation for vitamins A, B_1, C, and D were established.

The "unknowns" began to assume their chemical

identities with the preparation of pure crystals of vitamin B_1 in 1927 by Jansen and Donath (28); of crystalline D_2 called calciferol, by Askew and coworkers (29) in England, and by Windhaus in Germany in 1932; the isolation of vitamin C in 1932 (30) by C. G. King; and the establishment of the chemical constitution of vitamin A by Karrer in 1933 (31).

The list of vitamins and knowledge of their properties and functions have grown rapidly in the past two decades, so that there are now at least sixteen clearly identified vitamins, many of them existing in two or more active forms, and new vitamins are currently being added to the list. Several chemical compounds, such as niacin, para-aminobenzoic acid, carotene, and choline, were known in the nineteenth century and are now included in the vitamin list because of their physiologic functions.

Lack of space prevents any discussion of the studies on minerals and the discovery of the trace elements, or of the extensive studies on fats and essential fatty acids and of carbohydrates. All of these were major developments in this century with numerous investigators making their contributions.

Progress in nutrition can also be noted by the increase in the number of texts and journals on nutrition and of organizations devoted to its study. Some of these cannot pass unnoticed, even in a review as brief as this. The first textbook of nutrition in this country was *Science of Nutrition* by Graham Lusk, published in 1906 and continuing through four editions. Sherman's *Chemistry of Food and Nutrition*, first edition 1911 and now in its seventh edition, and Mary Swartz Rose's *Laboratory Handbook of Dietetics* in 1912, were the forerunners of numerous texts now available.

Journals devoted to dietetics and nutrition made their appearance in 1925 with the first issue of this JOURNAL. In September, 1928, the *Journal of Nutrition* was first published. *Nutrition Abstracts and Reviews*, covering the international field of the subject, came into being in 1931, and in 1942 *Nutrition Reviews*, presenting critical reviews of progress in this country, was established. The most recent addition to these ranks is the *British Journal of Nutrition* (October, 1947).

NATIONAL ORGANIZATIONS AND PUBLICATIONS

Milestones in nutrition progress are also marked by the organization of certain professional associations and national and international conferences. The American Home Economics Association, organized in 1908, was particularly interested in research in food and nutrition. The year 1917 saw the organization of the American Dietetic Association. The American Institute of Nutrition, incorporated in September, 1928, for the purpose of publishing its *Journal*, had eleven men on its board and John R. Murlin as Managing Editor. This organization decided to reorganize and enlarge its membership in 1933 and in April of that year, with H. C. Sherman as its president, the Institute started on its present career.

The far-reaching importance of nutrition was further emphasized when the League of Nations Assembly in September, 1935, set up a Mixed Committee on the Problem of Nutrition. This Committee published its report in four volumes. The Food and Agriculture Organization of the United Nations which had its inception at Hot Springs, Virginia, in June, 1943, now carries the responsibility for attention to international problems of nutrition.

In this country, attention to nutrition on a national scale was demonstrated by the appointment of the Committee on Food and Nutrition of the National Research Council in 1940 and the calling of the National Nutrition Conference for Defense in May, 1941.

PROBLEMS OF THE FUTURE

That chemical analysis cannot determine the value of a ration was early demonstrated by Wisconsin investigators (32). This remains true today as we continue to rely on the rat, chicken, dog, and monkey as a means of evaluating the adequacy and efficiency of rations and diets. Radioactive isotopes make it possible to study intermediary metabolism in man himself. Much remains to be done in nutrition research. Immediate problems awaiting solution are the prevention of dental caries, nutrition in relation to degenerative diseases, nutritional requirements in old age, nutrition in relation to excessive cell division, and the overall interrelationships of the nutrients. The short-term studies of the past need to be supported with longitudinal investigations on the relation of nutrition and life span and its effect on the whole organism.

REFERENCES

(1) HAZEN, C. D.: Modern European History. New York: Henry Holt and Co., 1917.
(2) MAGENDIE, F.: The nutritive properties of substances which contain gelatin. Ann. de Chim. et de Phys. 1st series 3: 66, 1817.
(3) TIEDEMANN, F., AND GMELIN, L.: Experimental physiological and chemical study of digestion in the four classes of vertebrates. Paris: J. B. Balliere, 1826.
(4) PORCHER, F. P.: Resources of the Southern Fields and Forests. Charleston, S. C.: Walker, Evans, and Cogswell, 1869.
(5) PROUT, W.: On the ultimate composition of simple alimentary substances. Phil. Trans. 1827, p. 355.
(6) LUNIN, N.: The significance of inorganic salts for the nutrition of animals. Ztschr. f. physiol. Chem. 5: 31, 1881.
(7) EIJKMAN, C.: A beri-beri-like disease of chickens. Virchows Arch. f. path. Anat. 148: 523, 1897.
(8) LUDWIG, J.: Feeding experiments with pigeons and rats using mixtures of simple ingredients. Ztschr. f. Biol. 58: 19, 1906.

(9) CHOSSAT, C. J. E.: Note on the osseus system. (From Milne Edwards, *Leçons sur la Physiologie*. Paris: 1863, Vol. 8, p. 190.) C. R. Acad. Sciences 14: 451, 1842.
(10) BOUSSINGAULT, J. B.: Rural Economy. Translated by G. Law. New York: D. Appleton and Company, 1845, p. 410.
(11) PAPILLON, M. F.: Studies of the modification of the composition of bone. C. R. Acad. Sciences 71: 372 1870.
(12) RINGER, S.: Concerning the influence exerted by each of the constituents of the blood on the contraction of the ventricle. J. Physiol. 3: 380, 1880.
(13) SUTTON, J. B.: Observations on rickets in wild animals. J. Anat. 18: 363, 1884.
(14) GORHAM, J.: Analysis of Indian corn. Quart. J. Sci., Literature, and Arts 11: 206, 1821.
(15) TADDEI, G. T.: A New Antidote (Gluten) for Corrosive Sublimate. Florence: 1820.
(16) ESCHER, T.: The substitution of gelatin and tyrosine for the protein of food and the significance in metabolism. Vierteljahrsschrift der Naturforschenden Gesellschaft in Züruch 21: 36, 1876.
(17) MACLEOD, G.: Mary Swartz Rose. J. Home Econ. 33: 221, 1941.
(18) OSBORNE, T. B., AND MENDEL, L. B.: Feeding Experiments with Isolated Food-Substances. Washington: Carnegie Institution, Pub. No. 156, Part 1, 1911, p. 1.
(19) SEARCY, G. H.: An epidemic of acute pellagra. Tr. Med. A. Alabama, 1907, p. 387.
(20) ELVEHJEM, C. A., MADDEN, R. J., STRONG, F. M., and Woolley, D. W.: The isolation and identification of the anti-black tongue factor. J. Biol. Chem. 123: 137, 1938.
(21) MARINE, D., AND KIMBALL, O. P.: The prevention of simple goiter in man. J. Lab. & Clin. Med. 3: 140, 1917.
(22) FUNK, C.: The chemical nature of the substance which cures polyneuritis in birds induced by a diet of polished rice. J. Physiol. 43: 395, 1911.
(23) DRUMMOND, J. C.: The nomenclature of the so-called accessory food factors (vitamins). Biochem. J. 14: 660, 1920.
(24) HOPKINS, F. G.: Feeding experiments illustrating the importance of accessory factors in normal dietaries. J. Physiol. 44: 425, 1912.
(25) MCCOLLUM, E. V., AND DAVIS, M.: The necessity of certain lipins in the diet during growth. J. Biol. Chem. 15: 167, 1913.
(26) OSBORNE, T. B., AND MENDEL, L. B.: The influence of butter-fat on growth. J. Biol. Chem. 16: 423, 1913.
(27) SHERMAN, H. C., LAMER, V. K., AND CAMPBELL, H. H.: The quantitative determination of the antiscorbutic vitamin (vitamin C). J. Am. Chem. Soc. 44: 165, 1921.
(28) JANSEN, B. C. P., AND DONATH, W. R.: Isolation of anti-beri-beri vitamin. Mededeel. Dienst. Volksgezondheid Nederland-Indie 16: 186, 1927.
(29) ASKEW, F. A., BOURDILLON, R. B., BRUCE, H. M., CALLOW, R. K., PHILPOT, J. ST. L., AND WEBSTER, T. A.: Crystalline vitamin D. Proc. Roy. Soc., London 109: 488, 1931–32.
(30) WAUGH, W. A., AND KING, C. G.: Isolation and identification of vitamin C. J. Biol. Chem. 97: 325, 1932.
(31) KARRER, P., MORF, R., AND SCHOPP, K.: Vitamin A in fish oil. 4. Helvet. med. acta 14: 1431, 1931.
(32) HART, E. G., MCCOLLUM, E. V., STEENBOCK, H., AND HUMPHREY, G. C.: Physiological effect on growth and reproduction of rations balanced from restricted sources. Wisconsin Agric. Exper. Sta. Research Bull. No. 17, 1911.

New Low-Cost Dairy Product

A new dairy product has been developed by Dr. Barnett Sure, head of the Department of Agricultural Chemistry, University of Arkansas College of Agriculture. Dr. Sure described this new product at the Federation of American Societies for Experimental Biology meetings, held in Atlantic City last March.

The dairy product consists of milk solids, supplemented with food yeast, fat, iron, and calcium salts, and is enriched with vitamins. Although it was not developed as a substitute for meat, in its finished form it has a protein content approximating that of round of beef and can be used in any recipe calling for ground meat.

Adaptable to traditional food dishes of many countries, the new food can be taken from the can, sliced, fried in shortening, and used for sandwiches; or it can be made into dairy loaves of different composition to meet various income levels; furthermore, it can be used as dairy balls in Spanish sauce and spaghetti, as croquettes in sauce, as ravioli, as tamalies, as chili con carne, and as mince meat pies. In many of these dishes the dairy product has a distinct meaty taste and is often difficult to distinguish from the meat product.

Test meals containing the new food in various forms have been given to a number of groups of people in the U.S. and Canada. Postoperative patients of the Fayetteville Veterans Facility have tried it out, and it seems to be well tolerated. Approximately 1500 persons including school children, civic club groups, students of the University of Arkansas, government officials, nutritionists, and newspaper men have found the food palatable and pleasing to the taste.

Animal experiments, carried on with albino rats over a period of six weeks, have also indicated the superior nutritive value of the vitamin-enriched processed dairy food. When it was used as the source of all nutrients, the twenty-four rats fed this diet grew more rapidly than an equal number of animals fed a purified diet of equal protein content, supplemented with liberal amounts of minerals and vitamins.

Studies of the Protein Requirements of Women[1]

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GOOD nutrition has been defined as a biochemical balance. If nutrition is measured in terms of a lifetime, it would assume that such a balance should include some reserve for meeting suddenly imposed physiological strains and, for the woman, the potential capacity to fulfill the functions of childbearing and rearing. Nutritional failure has been reported more frequently in women than in men (1). In the late nineteen twenties, many reports of the incidence of low hemoglobin concentrations among women were published with the interpretation that a degree of low grade malnutrition was prevalent. However, many of the early papers are difficult to interpret because studies were not controlled by observations on women without symptoms. To fill this gap, studies of women selected for physical integrity were started. College trained women were used, first because they were available and conditions of study could be controlled, and also because they represented a group with economic and social stability, as well as education above that of the general population. Studies have gradually been enlarged to include other population samples.

The role of protein in the maintenance of the nutrition of women will be the subject of this report. However, protein-containing foods are carriers of certain vitamins and minerals, and caloric equilibrium has been demonstrated to be essential (2) if proteins are to be used for tissue replacement rather than burned as fuel. Thus attention is directed to the entire dietary pattern of the individual if the full significance of protein-containing foods in meeting nutritional needs is to be measured.

[1] Journal Paper No. J-1539 of the Iowa Agricultural Experiment Station, Ames—Project No. 802. Michigan Agricultural Experiment Station, Journal article No. 966 (n.s.).

[2] Taken from a paper presented at the Dietetic Section of the meeting of the American Association for the Advancement of Science in Chicago, on December 29, 1947. Acknowledgment is made of the contributions of the many younger members of the staff who gave technical assistance to the problems studied and to the women who served as experimental subjects.

STUDIES OF PROTEIN AND CALORIC INTAKES

Table 1 records a series of studies of the food consumption of women of varying ages. The college group at the top of the table consisted of thirty-eight women who were observed at Iowa State College as freshmen and again as seniors and who answered a questionnaire directed toward recording their physical status five years after leaving college. The questionnaire included a record in approximate measures of one day's food intake. These women were an average college group without evidence of disease as determined by routine medical examinations. The investigators had close contact with them during four years of college, and the dietary records were believed to be carefully and honestly made. Records were analyzed by the revised method of Donelson and Leichsenring (3). Freshmen and senior records are from the Iowa series reported by Reynolds *et al.* (4) and were subjected to the same method of analysis. Since leaving college, eleven of these women reported acute illness or symptoms, such as unexplained weight changes, complications of pregnancy, or unusual susceptibility to infections, which could be related to nutritional causes. The records of these eleven women were separated for comparison under the designation "Health Problems."

The groups of women over forty years of age listed in Table 1 have been described in detail elsewhere (5). Each of the seventeen white women in the selected group was chosen for evidence of adult vitality and absence of disease, as determined by the medical examination, and was observed continuously from four to six months during which time repeated samples of food ingested were obtained for laboratory analyses. Weighed food samples also were obtained from the colored women, and nitrogen was determined by analysis. The larger group of white women was interviewed, and the results of questionnaires and dietary records similar to those presented for the college group are the basis for the findings reported. "Poor health" defines those in-

TABLE 1

Intakes of calories, protein, calcium, and phosphorus of groups of women from seventeen to seventy-four years of age

GROUP	AGE RANGE	NUMBER OF SUBJECTS	CALORIES	PROTEIN	CALCIUM	PHOSPHORUS
				gm.	*gm.*	*gm.*
College women	17–25	38	2177	70	0.91	1.24
	20–29	38	2180	69	0.97	1.25
	25–35	38	1983	71	0.95	1.27
"Health problems"		11	1848	69	0.91	1.22
Selected white women*	52–74	17	1854	63	0.92	1.19
Unselected white women**						
Good health	40–69	54	1658	56	0.65	1.00
Poor health	40–70	22	1465	48	0.56	0.87
Unselected Negro women**						
Good health	43–60	6	1789	56	0.59	0.77
Poor health	43–78	8	1122	41	0.41	0.52

* Ten of these cases have been reported earlier (5).

** From Ohlson *et al.* (5).

dividuals of apparently lowered vitality who complained of chronic ill health. Each woman was able to assume the responsibility for care of her home and family. "Good health" indicates those individuals who considered themselves well and vigorous and whose histories did not suggest disease processes which might influence nutrition. The distinction is arbitrary and is presented as such.

In each group where a degree of ill health was suggested, the food consumption was lower in both protein and calories. Calcium and phosphorus intakes related directly to the intake of milk, and there was an interesting contrast between the milk-drinking habits of the two generations. Except for the group of selected white women, all but two of whom used some milk regularly, women over forty showed a tendency to replace milk with other beverages with resulting lower intakes of nitrogen, calcium, and phosphorus. It may be pointed out that mean intakes of other nutrients could be predicted from the ingestion of calories, protein, and calcium. Iron intakes did not average more than 12 mg. per day in any of the groups studied and fell below this value as the protein intake decreased from 70 gm. per day. Thiamine was estimated as averaging 1.1 mg. per day in diets containing 70 gm. of protein and tended to decrease as protein decreased. Riboflavin exceeded 1.2 mg. per day only when milk was taken in amounts exceeding a pint per day.

In all groups there was a high correlation between the intake of calories and protein which confirmed the impression gained from a study of the menus that dietary patterns were similar for all groups of women and intake differences tended to be quantitative rather than qualitative. Correlation coefficients ranged from 0.66 to 0.84. Since, with correlation coefficients of this magnitude, the chances are less than one in ten thousand that the relationship is fortuitous, the number of calories required to furnish 60 gm. of protein from the dietary patterns represented was estimated[3] for the combined data on older women and for the college women at each period of study. Table 2 presents these computations with the standard error of estimate[3] of each predicted figure.

TABLE 2

Predicted calories as required to provide 60 gm. protein on diets as selected

GROUP	NUMBER OF CASES	PREDICTED CALORIES	ERROR OF ESTIMATE
			calories
Older women	100	1756.0	237
College women			
Freshmen	38	1973.5	302
Seniors	38	1978.3	204
Women five years after graduation	38	1771.9	365

The figures are of particular interest with respect to caloric intakes below the estimated value. Even though the errors of estimate are high, a woman choosing a low caloric diet from the food patterns represented by this study would have less than an even chance of consuming 60 gm. of protein unless she practiced a precise food selection unusual even among women trained in home economics. The high errors of estimate in the freshmen and five-year college groups are difficult to interpret. Young and Donelson (7) have suggested that greater variability in the basal metabolism may be expected in inexperienced freshmen than in a stable senior group. If this constitutes a real behavior difference, wider

[3] The formulas used were as follows (6):

For predicted calories, $E = \bar{Y} + \frac{S \times y}{Sx^2}(60 - \bar{x})$

For standard error of estimate, $Sy \cdot x = \frac{(Sy^2 - (sxy)^2/Sx^2}{N - 2}$

variations in food selection should not be unexpected. The last record of the college trained women was taken in 1944. Sixty-three per cent of the group were married and the larger proportion of them were living near training camps or with their parents while their husbands were in the armed services. Comments concerning the irregularity of the living situation were frequent. Perhaps this is not a truly "normal" situation, but it constitutes one form of physiological strain which young women have faced in the last decade.

The tendency to reduce protein intake as calories were reduced was less evident under two conditions both of which are worthy of comment. A few older women ate meat, bread, and potatoes and little else. The resulting protein intake was high and the caloric intake low. Intakes of calcium, vitamin A, and ascorbic acid also were low as would be expected. Secondly, the college trained women, most of whom were graduates in home economics, had reduced caloric intakes by about 15 per cent five years after graduation but had done so by the omission of sweets so that protein consumption was little affected. Although individual weight changes as high as 30 lb. were recorded, the mean weight of these women had increased only 1.5 lb., five years after graduation.

PREDICTED PROTEIN REQUIREMENTS

Another approach to the question of protein requirement has been made by way of the balance experiment. Table 3 records the results of balance periods conducted under conditions of diet planned to interfere as little as possible with the usual food choices or living habits of women. The data on the 124 subjects of college age are taken from the paper of McKay *et al.* (8). Nine of the older women were included in an earlier paper (5). The other six older women were studied at Michigan State College.

TABLE 3

Nitrogen intakes and retentions of college-age and older women

RANGE OF DAILY NITROGEN INTAKE	124 COLLEGE-AGE WOMEN*			15 WOMEN 50 TO 75 YEARS OLD		
	Number of studies	Mean balance	Subjects in positive nitrogen balance	Number of studies	Mean balance	Subjects in positive nitrogen balance
gm.		*gm.*	%		*gm.*	%
5.55–5.99	1	−1.67	0	1	−0.80	0
6.00–6.99	3	−0.72	33	4	0.00	**
7.00–7.99	14	−0.62	14	10	−0.58	40
8.00–8.99	19	0.02	63	15	−0.66	53
9.00–9.99	26	0.38	69	28	−0.35	57
10.00–10.99	26	1.09	92	21	0.49	76
11.00–11.99	15	1.07	80	18	−0.82	50
12.00–12.99	11	1.37	100	14	1.10	71
13.00–13.99	3	1.53	100	3	−0.10	67
14.00–14.99	3	2.59	100	3	0.83	100
15.00–17.58	3	2.89	100	4	2.65	100

* Quoted from McKay *et al.* (8).

** All cases within 0.5 gm. of equilibrium.

The correlation coefficients, which express the relation of intake and retention of nitrogen, were 0.73 and 0.59 for the college and older groups, respectively. The chances that the relationship is significant are about ninety-nine to one in the case of the older women, and several times that for the college group. Thus, in the college group, the influence of increasing protein intakes on the retention of nitrogen is clear. With each increase in intake, both the amount retained and the percentage of subjects who retained nitrogen increased. In the case of the older women, the relationship is not as clear, and a study of the responses of individual women to graded intakes of protein suggests that the relationship between intake and retention is found only at intakes which result in negative retentions. When sufficient protein is ingested, retention among older women appears to be influenced by factors other than intake, and the mean retention on a high-protein intake tends to be close to zero. This result would, of course, be predicted in an adult maintaining but not increasing body stores. However, the capacity of younger women to retain nitrogen in direct ratio to the amount ingested does not support the assumption of maturity at this age.

The capacity of younger women to utilize larger intakes of protein has been demonstrated further by Cederquist *et al.* (9). Six subjects, eighteen to twenty-four years of age, were studied for 102 days each. A weighed basal diet composed of food mixtures commonly eaten by college women and containing 0.67 to 0.70 gm. of protein per kilogram of weight was used, and protein was increased by the addition of meat and milk. Five experimental periods were studied in the order listed: self-selected diet during which no restrictions were made on the total amount of basal diet consumed; twenty-five days on basal diet alone; eighteen days on basal diet plus meat and milk to provide 1 gm. of protein per kilogram; fourteen days on high-protein (1.66 gm. per kilogram); and twenty-eight days on basal diet only. On a self-selected diet, subjects ate an average of 65.4 gm. of protein per 60-kg. woman, and five out of six were in positive nitrogen balance. At intakes of nitrogen equivalent to 100 gm. of protein per day per 60-kg. woman, retentions ranged from 1.2 to 4.2 gm., of nitrogen per day. The failure to adjust to a lowering of the protein intake to 0.70 gm. per kilogram per day was demonstrated in the low-protein periods in which metabolic samples were taken at the beginning and end of study. When all balance periods were considered, it was possible to predict (by means of regression) that the mean intake of protein required for equilibrium was 45 gm. per day for the six subjects, when the data were adjusted to a mean weight of 60 kg. (Table 4).

TABLE 4

Predicted protein intake required for equilibrium

GROUP	PROTEIN* gm./day
Younger women	
Cederquist (9)	45 to 48
McKay (8)	54
Older women	
Individual predictions	45 to 79
Mean for eight subjects	53

* Nitrogen x 6.25.

McKay *et al.* (8) predicted that a mean intake of 56.0 gm. of protein per day was required for equilibrium by a group of 124 women eating self-selected diets.

Eight of the older women included in Table 3 were observed over sufficiently wide ranges of nitrogen intake that similar predictions of protein requirements could be made. Four of these women were in equilibrium when 0.71 to 0.75 gm. protein per kilogram was ingested daily. Four women required 0.81, 0.97, 1.03 and 1.31 gm. per kilogram, respectively. Thus the range of protein required for equilibrium in older women averaging 60 kg. was from 43 to 79 gm. per day. Covariance (6) was used to combine data from these eight subjects. A mean requirement of 0.88 gm. protein per kilogram of weight (or 53 gm. per woman) was obtained.

All of these estimates of protein requirement are in excess of the predictions of Hegsted *et al.* (10) for adults. However, the conditions of the experiment differed sharply. First, the work reported herein has been confined to women. Although it has always been assumed that an adult woman's nitrogen metabolism is the same as that of the adult man except during periods of reproduction, the metabolic behavior of young women given more than a gram of protein per kilogram per day raises a question as to when adult saturation can be assumed to occur and if equilibrium can be taken as a standard for dietary recommendations for women during the early twenties. Secondly, the food served in the experiments quoted was, in all cases, characteristic of the habits of intake of women of the North Central States. The influence of the balance of the diet as a whole on the utilization of specific nutrients has been inadequately tested. It is pertinent that the subjects in McKay's study were consuming self-selected diets, whereas Cederquist's subjects ate from a basal diet in which both the kind and amount of food and the regularity of meals were carefully controlled. A third respect in which these studies differ from previous ones is that protein utilization has been studied at intakes both above and below that required for equilibrium. The statistically computed prediction for requirements is, in each case, within the range of intakes used experimentally rather than extrapolated from data based on negative retentions.

TABLE 5

Protein and caloric intakes of subjects discharged from a tuberculosis sanatorium to a pneumothorax clinic

NUMBER OF CASES	PROTEIN INTAKE		CALORIC INTAKE	
	Mean	Range	Mean	Range
	gm.	*gm.*	*gm.*	*gm.*
3	46	41–49	1056	917–1238
8	56	50–60	1530	1179–2010
8	67	63–73	1713	1610–1854
8	82	78–87	1978	1365–2332
3	103	90–117	2438	1603–3320

EVALUATION OF SUGGESTED STANDARDS OF PROTEIN INTAKE

The ultimate evaluation of studies of food requirements for normal individuals depends on the response to physiological strain. The advantages of increased protein intake during pregnancy have been demonstrated (11, 12). Certain evidence is available that minimum protein intakes do not provide a factor of safety in meeting physiological strains in young women. Leverton, McMillan, and Peters in 1944 (13) studied the capacity of seventeen healthy college women to replace hemoglobin after a routine donation of 500 cc. of blood. The basal diet in all cases was the same and contained 50 gm. of protein per day. Supplements added 25 gm. of protein from animal sources. Seventy-five gm. of protein per day permitted a steady increase of hemoglobin to 44 per cent of the amount lost after sixty-seven days. On the same diet and without supplementary protein, regeneration was irregular and only 12 per cent of the total hemoglobin lost had been replaced in sixty-seven days. In a later publication (14), 90 gm. of protein per day were found to promote more quantitative replacement of hemoglobin than any of a variety of supplements, including iron and several vitamins.

The menstrual discharge in normal women has been demonstrated to represent a relatively minor blood loss. However, it is a loss repeated at regular intervals for twenty-five or more years, and it is of some interest that healthy college women of this area (15) averaged only 13.4 gm. of hemoglobin per 100 cc. of blood with a standard deviation of 1.16 gm., whereas fifteen healthy women over fifty who no longer suffered periodic losses of blood but who chose food from the same dietary pattern averaged 14.9 gm. of hemoglobin, and the standard deviation was only 0.79 gm. Current medical practice is to prescribe iron for the low hemoglobin concentrations of women. One might question how often the intake of protein is investigated.

Our laboratories recently have been concerned with the food intakes of young women discharged from a tuberculosis sanatorium. Table 5 summarizes dietary records taken over a period of a year.

Not less than seven days were recorded for each woman. Again the relationship between calories and protein is apparent, although the protein ingested per thousand calories tended to be somewhat greater than that of normal women because of a low intake of sweets. Eighteen to twenty-four months after the dietary records were taken, the program of exercise of the subjects was checked with the clinic records as an index of the activity of disease[4]. Table 6 records the progress of thirty women patients in recovery from clinical tuberculosis. Although the series is limited, the group showing most consistent progress was that with a mean intake of approximately 80 gm. of protein and 2000 calories. Six of eight patients had attained full activity and were maintaining a normal work load without symptoms. Two had moved from the community and could not be located.

TABLE 6

Physical activity correlated with protein intake of subjects discharged from a tuberculosis sanatorium to a pneumothorax clinic

ACTIVITY STATUS OF WOMEN 18 TO 24 MONTHS AFTER STUDY OF DIETS	NUMBER OF PATIENTS				
	Protein intake below 50 gm.	Protein intake 51–62.4 gm.	Protein intake 63–74.9 gm.	Protein intake 75–84 gm.	Protein intake above 85 gm.
Full activity		4	2	6	1
Activity increased, not yet maximum	1	1	2		
No change, activity limited	2	1	2		1
Readmitted to sanatorium		1	1		1
Records missing		1	1	2	
Total	3	8	8	8	3

The two failures in the high-protein group are of interest. Both were over 69 in. tall and heavy boned, "spare" women. One, a colored woman about thirty years old, ate only two regular meals a day, and meat and cereal were the foods eaten regularly and in large amounts. The second patient, who was readmitted to the hospital with sputum positive for tubercule bacillus, was a Polish girl of eighteen who averaged 3 qt. of milk and a pint of red wine daily and ate little else. In spite of high-protein intakes, both of these diets were badly balanced and laboratory evidence of specific malnutrition was obtained.

Finally, there have been few careful metabolic studies of women during weight reduction in spite of the frequency with which a routine reduction diet is prescribed with little or no specific direction for its use. It is assumed that nitrogen equilibrium will be possible if a gram of protein per kilogram of weight is eaten. However, caloric restriction to the degree that regular weight loss is attained must be precise. A pint of whole milk, 4 oz. of lean meat, two servings of cereal or equivalent, one egg, and four to six vegetables and fruits will average 1000 calories and yield only 55 gm. of protein. Brown and Ohlson (16) found that healthy young college women lost weight regularly on 1200 calories and 70 gm. of protein. The mean nitrogen retention was 0.27 gm. per day, which is essentially equilibrium. However, the necessary dietary restrictions could be maintained only when a training table supervised by a skilled dietitian was available. Periods when students were allowed to select their own food resulted in both poorer diets and less regular weight losses. It might be questioned how many times failures in reduction may be ascribed to a failure to achieve a balance between protein and calories which will assure the combustion of stored fat.

[4] Acknowledgment is made to Dr. C. J. Stringer, Medical Director, Ingham County Tuberculosis Sanatorium, for access to these records and for his cooperation in the study.

SUMMARY AND CONCLUSIONS

Healthy women of the North Central States eat food from a basic dietary pattern in which the intake of protein and calories is closely related. In order to provide 60 gm. of protein per day, or 1 gm. per kilogram, careful selection of food is necessary as soon as calories are reduced below 1750 to 2000 per day. On a controlled diet, made up of food characteristic of the group but eaten in prescribed amounts, 45 gm. of protein per day per 60-kg. woman were required for equilibrium in well nourished, college women. When food was eaten *ad libitum*, 54 gm. protein per day were needed. Aging women, consuming food *ad libitum*, required an average of 53 gm. protein per 60-kg. woman. None of these estimates allow for a factor of safety in utilization nor do they provide for the apparent capacity for protein retention in well nourished young women.

Evidence is available that protein intakes from 70 to 90 gm. per day protect young women during certain periods of physiological strain. Few adult women of the North Central area eat more than 70 gm. of protein per day unless more than 2000 calories are consumed.

REFERENCES

(1) Spies, T. D., and Collins, H. S.: Observations on aging in nutritionally deficient persons. J. Gerontology 1: 33, 1946.

(2) Lusk, G.: The Science of Nutrition. 4th ed. Philadelphia: W. B. Saunders Company, 1931.

(3) Donelson, E. G., and Leichsenring, J. M.: Food composition tables for short method of dietary analysis (revised). J. Am. Dietet. A. 21: 440, 1945.

(4) Reynolds, M. S., Ohlson, M. A., Pittman, M. S., McKay, H., Patton, M. B., Donelson, E., Leverton, R., Meiller, E. J., and Bitting, M. H.: The dietary habits of college students. J. Home Econ. 34: 379, 1942.

(5) Ohlson, M. A., Roberts, P. H., Joseph, S. A., and Nelson, P. M.: Dietary practices of 100 women from 40 to 75 years of age. J. Am. Dietet. A. 24: 286, 1948.
(6) Snedecor, G. W.: Statistical Methods. 4th ed. Ames, Iowa: The Iowa State College Press, 1946.
(7) Young, C. M., and Donelson, E. G.: Activity as it affects the basal metabolism of college women. J. Am. Dietet. A. 22: 303, 1946.
(8) McKay, H., Patton, M. B., Ohlson, M. A., Pittman, M. S., Leverton, R. M., Marsh, A. G., Stearns, G., and Cox, G.: Calcium, phosphorus and nitrogen metabolism of young college women. J. Nutrition 24: 367, 1942.
(9) Cederquist, D. C., Brewer, W. D., Radar, N. J., and Ohlson, M. A.: Nitrogen metabolism of college women. Federation Proc. 6: 404, 1947.
(10) Hegsted, D. M., Tsongas, A. G., Abbott, D. V., and Stare, F. J.: Protein requirements of adults. J. Lab. & Clin. Med. 31: 261, 1946.
(11) Ebbs, J. H., Tisdall, F. F., and Scott, W. A.: The influence of prenatal diet on the mother and child. J. Nutrition 22: 515, 1941.
(12) Burke, B. S., Beal, V. A., Kirkwood, S. B., and Stuart, H. C.: The influence of nutrition during pregnancy upon the condition of the infant at birth. J. Nutrition 26: 569, 1943.
(13) Leverton, R. M., McMillan, T. J., and Peters, M.: Blood regeneration in women blood donors. 1. Effects of generous amounts of meat and milk in the diet. J. Am. Dietet. A. 20: 747, 1944.
(14) Leverton, R. M., and Schlaphoff, D.: Effect of protein, vitamin and mineral supplements on blood regeneration in women donors. Federation Proc. 6: 413, 1947.
(15) Ohlson, M. A., Cederquist, D., Donelson, E. G., Leverton, R. M., Lewis, G. K., Himwich, W. A., and Reynolds, M. S.: Hemoglobin concentrations, red cell counts and erythrocyte volumes of college women of the North Central States. Am. J. Physiol. 142: 727, 1944.
(16) Brown, E. G., and Ohlson, M. A.: Weight reduction of obese women of college age. 1. Clinical results and basal metabolism. J. Am. Dietet. A. 22: 849, 1946.

The Thyroid and Vitamin A

Some six years after the announcement of the discovery of vitamin A, attention was called to striking parallelism between the activity of vitamin A and the natural yellow color in plant sources of this food factor. Thus rutabagas, sweet potatoes, and even yellow daffodils were shown to be superior in protecting experimental animals against the sequels of vitamin A deficiency than are the nonyellow varieties of the same plants. Later the yellowness was shown to be due to several hydrocarbon pigments that occur naturally in plants; alpha, beta, and gamma carotene and cryptoxanthine are examples of this type of pigment which have come to be known as pro-vitamins A. Obviously, carotene is transformed into vitamin A in the animal body, for when this pigment is fed, there results an accumulation of vitamin A. This circumstance, together with the fact that the liver is the most important site of storage of vitamin A in the body, has led to the ready assumption that the locus of transformation of carotene to vitamin A is the liver. That this view is open to question has been pointed out recently. In any case, it is desirable to know the factors that influence this change.

The older clinical literature recounts repeated instances which indicate that the activity of the thyroid gland is in some way involved in the carotene-vitamin A relationship. Thus it has been demonstrated that carotene accumulates in the milk after thyroidectomy; the cretin shows inability to change carotene to vitamin A; carotinemia is frequently encountered in patients showing clinical and laboratory signs of hypothyroidism; patients with untreated myxedema are likely to have high levels of carotene in the blood, and animals treated with anti-thyroid drugs like thiouracil give evidence of vitamin A deficiency despite adequate amounts of carotene in the diet. A recent report has submitted the thesis to further experimental study; after demonstrating again the effectiveness of carotene to replace vitamin A in the ration, it was shown that after thyroidectomy carotene failed to protect against xerophthalmia, whereas preformed vitamin A did exert the expected protective action. Similarly, Johnson and Baumann have demonstrated that the storage of vitamin A in the liver and kidneys is minimal when thiouracil and thiourea are present in the diet with carotene, but not when the vitamin itself is given. The addition of thyroxin to those diets again permits the change of carotene to vitamin A.

In postulating a mechanism for the promoting action of thyroid hormone in the change of carotene to vitamin A, the calorigenic activity of thyroxin comes to mind. However, the Wisconsin investigators have shown that this action is a specific function of the thyroid, as the increased basal metabolic rate produced by 2,4-dinitrophenol did not influence the foregoing phenomenon. The significance of further definitive data on the mechanism of this influence of the thyroid is readily appreciated when one considers that a large part of the daily intake of vitamin A potency may be in the form of the precursor, carotene, and that the effects of a deficiency of this essential food factor results in severe tissue damage and widespread functional derangement.—*From an Editorial, J.A.M.A., 137: 91 (May 1), 1948.*

Observations Concerning the Post-Operative Diet

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In 1946–47, Project #4 of the Diet Therapy Section of the American Dietetic Association was "To Study the Relationship of Diet, Type of Operation and Anesthesia to Post-Operative Nausea, Distention, and Vomiting." In this project, a total of 230 cases were reported by members in seventeen state associations. This article includes a summary of the collected data, as well as a review of the literature and a bibliography. The chairman wishes to express her appreciation to all members of the American Dietetic Association who have in any way contributed to this project. The members of the committee were: Cora E. Gray, The Woman's College, University of North Carolina, Greensboro, and members of the Rochester (Minnesota) Dietetic Association.

FROM THE literature, it appears that great emphasis has been placed on factors other than food as being responsible for causing nausea, distention, and vomiting subsequent to surgery.

The sources of intestinal gases which accumulate post-operatively have been ascribed to the decomposition of intestinal contents, the diffusion of blood gases, and the swallowing of atmospheric air. Evidence which has been presented by McIver, Benedict, and Cline (1) indicates that swallowed air is the major cause of post-operative distention. The gases which are not rapidly absorbed (2) are hydrogen, methane, and nitrogen. Carbon dioxide, hydrogen sulphide, and oxygen do not become significant factors in causing distention unless these gases accumulate more rapidly than they can be absorbed.

Peristalsis is one of the most important means of ridding the intestinal tract of accumulated gases. Differences of opinion exist as to the effects of the anesthetic agents on intestinal tone and motility. Johnson and Mann (3) report from observations on dogs that anesthetic agents may have either a depressing effect on gastric tonus and motility or no effect at all. Further experimental work by Golden and Mann (4) indicate that the depth of the anesthetic is probably more important than the duration in producing a depression on intestinal activity. Webb (5) describes the "gas pains" which follow surgery as probably hypertonic contractions of a previously paralyzed musculature which is again regaining its tone.

Mahoney (6), Horton (7), Webb (5), and others have reported favorable results with a more solid type of diet served soon after surgery. It has been observed that with more solid foods, there is an earlier return to normal intestinal activity and less post-operative gaseous distention. The liquid diet is discouraged on the basis that liquids admit a large amount of air during swallowing. Although early feedings are encouraged, Kugelmass (8) suggests that nothing should be given by mouth until nausea and vomiting have subsided. Usually any attempt to force liquids at this time induces reverse peristalsis.

The composition of the food served during the immediate post-operative period also may be a factor to consider. From experimental work on starving cats, Fine and Leverson (9) report that liquid carbohydrates of high glucose content which often appear on the liquid hospital diets are important sources of distending gases. Carbohydrates of a more solid nature, such as toast, cereal, and so on, need not be considered as a source of gas formation. From 69 to 90 per cent of the gaseous content of orange juice, whole egg, milk, and custard are composed of hydrogen, nitrogen, and methane.

In addition, pre- and post-anesthetic medications are factors to be considered. It is recognized that when morphine is given in therapeutic doses, it causes nausea or vomiting. Steele (10) considers that the administration of suitable narcotics has greatly reduced the incidence of post-operative nausea and vomiting.

Another factor of importance as summarized by Horton (7) is the type of surgery performed. Prolonged exteriorization and manipulation of the abdominal viscera or rough handling of the abdominal contents are apt to be followed by distention.

The type of anesthetic and the method of its ad-

ministration cannot be overlooked. Smith (11) points out that vomiting after 12 hr. following surgery cannot be attributed to the anesthetic. Also, the incidence of vomiting is increased with the use of ether and to a certain extent by cyclopropane.

Last of all, the age, sex, temperament, and condition of the patient are all factors which cannot be disregarded in post-operative nausea, distention, and vomiting. An apprehensive, anxious type of patient is usually more uncomfortable than the stolid phlegmatic type.

In order to make some observations on the relationship of the post-operative diet to nausea, distention, and vomiting, members of the Diet Therapy Section of the A.D.A. were invited to submit selected case studies. The type of case was limited to the following: simple appendectomy, uncomplicated cholecystectomy, gastric resection, or gastroenterostomy. Each observation period covered ten to fourteen consecutive post-operative days unless the patient was dismissed at an earlier time. The following information was noted for each case:

(a) Type of operation
(b) Type of anesthesia given
(c) Length of time anesthesia was administered
(d) Patient's temperament
(e) Name of diet served
(f) Response to diet
(g) Kind and amount of narcotics given
(h) Indication of nausea, distention, and vomiting
(i) Date when milk was first added to the diet

In addition, a questionnaire which had been prepared to indicate the trend of feeding patients following surgery was sent to directors of approved hospital courses. The questions centered around the dietary regimen following surgery.

A total of 230 case studies were reported by members of the Diet Therapy Section in seventeen state associations. However, a total of twenty-eight cases were deleted for various reasons.

TABLE 1

Cases of appendectomy experiencing post-operative nausea, distention, and vomiting

NUMBER OF PATIENTS	POST-OPERATIVE DAYS	INCIDENCE OF NAUSEA	INCIDENCE OF DISTENTION	INCIDENCE OF VOMITING
		%	%	%
79	1	23	8	19
79	2	21	30	19
79	3	5	26	6
78	4		19	
68	5		9	
52	6		3	
34	7		11	
18	8		5	
12	9		16	
6	10		16	

OBSERVATIONS FROM RECORDS OF PATIENTS WITH APPENDECTOMY

Of the 79 records studied, 39 were male and 41 were female subjects. The studies extended over a period of fourteen consecutive days; however, 80 per cent of the patients were dismissed between the fifth and ninth post-operative day; the day of surgery was counted as the first post-operative day.

Nausea, distention, and vomiting. Nausea and vomiting were recorded for patients only on the first three post-operative days. However, patients experienced distention until the tenth post-operative day (Table 1).

The addition of milk to the diet. On 62 of the case histories, a note was made indicating the day on which milk was first served to the patient. Of the patients receiving milk, distention was noted in only 20 per cent (Table 2).

Type of foods served in the immediate post-operative period. Since early feeding of solid food is being recognized as a factor in decreasing post-operative distention, a comparison was made (Table 2) between the kind of diet served and the number of cases noting distention. As indicated in Table 2, the longer a liquid diet was served, the greater was the number of patients noting distention. The reverse is noted when the solid type of diet was served.

The kind of anesthetic agent and the length of administration. Due to the great variation in the combination of anesthetic agents used and the limited number of cases under each group, no observations were made on the relationship of post-operative nausea, distention, and vomiting, type of diet, and kind of anesthetic agent.

In evaluating the observations presented above, sight should not be lost of the fact that each patient is an individual. The studies were made by many

TABLE 2

Cases of appendectomy experiencing post-operative distention when receiving no food, liquid foods, milk, and solid foods

POST-OPERATIVE DAYS	PATIENTS RECEIVING NO FOOD		PATIENTS RECEIVING LIQUID FOODS		PATIENTS RECEIVING MILK		PATIENTS RECEIVING SOLID FOOD	
	Total number of patients	Patients experiencing distention	Total number of patients	Patients experiencing distention	Total number of patients	Patients experiencing distention	Total number of patients	Patients experiencing distention
1	33	5	46	2	1	0	0	0
2	5	4	60	16	21	1	14	5
3			32	10	42	4	47	10
4			13	6	52	7	65	9
5			5	1	51	1	63	5
6			1	0			61	2
7							44	3
8							27	1
9							14	1

TABLE 3

Cases of cholecystectomy experiencing post-operative nausea, distention, and vomiting

NUMBER OF PATIENTS	POST-OPERATIVE DAYS	INCIDENCE OF NAUSEA	INCIDENCE OF DISTENTION	INCIDENCE OF VOMITING
		%	%	%
66	1	47	40	36
66	2	40	39	13
66	3	16	36	12
66	4	10	31	10
65	5	10	26	6
62	6	11	20	4
59	7	8	8	6
55	8	9	9	5
47	9	6	2	4
36	10	2	0	5
30	11	3	3	0
23	12	8	8	0
14	13	14	0	0
10	14	20	20	10

observers, and no attempt was made to control the many factors which may be significant in post-operative nausea, distention, and vomiting.

OBSERVATIONS MADE FROM RECORDS OF PATIENTS WITH CHOLECYSTECTOMY

Of the 66 subjects studied, 49 were females and 17 were males. The studies extended over a period of from seven to twenty-five consecutive days; however, 90 per cent of the patients were dismissed between the sixth and the thirteenth post-operative days.

Nausea, distention, and vomiting. Nausea, distention, and vomiting were reported by patients during the first fourteen post-operative days. The greatest number of cases reported nausea and vomiting during the first three post-operative days, while 20 per cent of the cases still noted distention on the sixth post-operative day (Table 3).

The addition of milk to the diet. According to case histories, milk was served to forty-nine patients. Of this number, 36 per cent experienced distention (Table 4). According to Table 4, the addition of milk to the diet could not be considered a very important factor in the cause of gaseous distention.

Type of foods served in the immediate post-operative period. Although the trend may be toward early post-operative feedings of solid foods, observations made on these studies do not bear out this trend. It is noted that only one patient received a solid type of diet on the second post-operative day and that on the fifth post-operative day, only 65 per cent of the cases were receiving a soft diet (Table 4). During the first three post-operative days, more patients noted distention when served liquids than those who were not receiving food by mouth. According to those patients experiencing distention on the third post-operative day, little difference was noted between the groups receiving a liquid or solid type of diet.

TABLE 4

Cases of cholecystectomy experiencing post-operative distention when receiving no food, liquid foods, milk, and solid foods

POST-OPERATIVE DAYS	PATIENTS RECEIVING NO FOOD		PATIENTS RECEIVING LIQUID FOODS		PATIENTS RECEIVING MILK		PATIENTS RECEIVING SOLID FOOD	
	Total number of patients	Patients experiencing distention	Total number of patients	Patients experiencing distention	Total number of patients	Patients experiencing distention	Total number of patients	Patients experiencing distention
1	45	16	21	11	0	0	0	0
2	13	2	52	24	3	1	1	0
3	1	0	53	21	21	5	12	3
4			32	8	31	8	34	14
5			22	4	34	1	44	13
6			11	4	46	4	54	9
7			6	3	47	0	56	5
8			4	1	47	0	55	4
9			2	0	45	0	53	1
10			2	0			45	0
11			2	0			34	1
12			2	1			28	1
13			2				19	0
14			1				13	1
15			1				9	0
16			1				6	0

In reviewing the observations made on the sixty-six cases with cholecystectomy, the many factors other than diet in post-operative nausea, distention, and vomiting must not be overlooked.

OBSERVATIONS MADE FROM THE RECORDS OF PATIENTS WITH GASTRIC SURGERY

Of the 57 patients with gastric surgery (gastro-enterostomies and gastric resections), 48 were males and 9 were females. Although the study was planned to cover a period of only fourteen consecutive days unless the patient was dismissed at an earlier date, many studies were continued during the patient's entire period of hospitalization. The stormier the post-operative period, the longer the patient remained in the hospital.

Nausea, distention, and vomiting. To a certain degree, post-operative nausea, distention, and vomiting continued throughout the entire post-operative course (Table 5). The greatest percentage of patients experienced nausea and vomiting during the first three post-operative days; gaseous distention was a problem to a larger percentage of the patients for a longer period of time. Considering the type of surgery, the percentage noting discomfort seems relatively low. In some cases, post-operative nausea, distention, and vomiting may have been reduced by the use of a nasal tube for the first few days immediately following surgery.

TABLE 5

Cases of gastric surgery experiencing post-operative nausea, distention, and vomiting

NUMBER OF PATIENTS	POST-OPERATIVE DAYS	INCIDENCE OF NAUSEA	INCIDENCE OF DISTENTION	INCIDENCE OF VOMITING
		%	%	%
57	1	19	11	14
57	2	28	21	14
57	3	14	30	4
57	4	8	28	4
57	5	7	17	4
57	6	7	17	4
57	7	4	7	1
57	8	4	4	3
53	9	7	5	2
53	10	5	4	2
37	11	2	2	0
31	12	0	6	0
25	13	4	4	8
19	14	5	5	10
13	15	0	0	0
11	16	9	9	0

The addition of milk to the diet. On fifty-four of the case histories, notes and comments were made regarding the addition of milk to the diet. Considering the amount of milk included on diets served to patients following gastric surgery, a very small percentage of the cases indicated gaseous distention when milk was served (Table 6).

Type of foods served in the immediate post-operative period. After analysis of the diets which accompanied the case studies, the diets served to post-operative surgery cases were grouped for comparative purposes according to the consistency of the diet. Considering the variety of diets served following gastric surgery, an appreciation of the complexity of this problem is gained. From Table 6, again it is evident that a solid type of diet is usually not served to patients until the sixth or seventh post-operative day, while the greatest amount of distention was noted during the first five post-operative days when either the patient was on a liquid diet or took no food or fluids by mouth.

TRENDS IN FEEDING PATIENTS DURING THE IMMEDIATE POST-OPERATIVE PERIOD

The questionnaire which was used to study the trend of feeding patients during the immediate post-operative period was returned by thirty-four directors of approved hospital internships for dietitians. The routine used for feeding patients with selected types of surgery varies greatly throughout the country. There is variation not only in the kind of food served, but also in the time when the patient first receives a tray. In 30 per cent of the hospitals, carbonated beverages, coffee, orange juice, and other very sweet fruit juices are not included on the clear liquid diets. On 75 per cent of the liquid diets, grape juice is not served. Milk and milk products are restricted on the clear liquid diet, but as the diets are advanced, no restrictions were indicated.

TABLE 6

Cases of gastric surgery experiencing post-operative distention when receiving no food, liquid foods, milk, and solid foods

POST-OPERATIVE DAYS	PATIENTS RECEIVING NO FOOD		PATIENTS RECEIVING LIQUID FOODS		PATIENTS RECEIVING MILK		PATIENTS RECEIVING SOLID FOOD	
	Total number of patients	Patients experiencing distention	Total number of patients	Patients experiencing distention	Total number of patients	Patients experiencing distention	Total number of patients	Patients experiencing distention
1	53	6	4	0	0	0	0	0
2	35	8	22	6	1	0	0	0
3	22	3	35	14	7	1	0	0
4	10	2	47	16	17	4	0	0
5	5	1	48	11	34	3	4	0
6	1	1	44	13	44	8	12	0
7			37	5	49	5	20	1
8			18	3	53	4	39	0
9			12	2	53	3	45	2
10			6	1	50	2	46	1
11			1	1	35	2	36	1
12			0	0	29	3	30	1
13			2	1	22	2	24	2
14			1	1	17	2	18	1
15					13	1	13	1
16					11	1	11	1
17							8	0
18							7	0
19							5	0
20							3	0

SUMMARY AND RECOMMENDATIONS

A total of 202 case studies were reviewed in an attempt to learn the relationship of diet to post-operative nausea, distention, and vomiting. Appendectomy, cholecystectomy, gastric resection, and gastroenterostomy were the types of cases selected. Observations were made on the effect of milk, early feedings of liquid foods, and early feedings of solid food on post-operative gaseous distention.

No attempt was made to draw conclusions regarding the effect of diet on post-operative nausea, distention, or vomiting, because of the many variants which could not be controlled.

REFERENCES CITED

(1) McIver, M. A., Benedict, E. B., and Cline, J. W., Jr.: Postoperative gaseous distention of the intestine. Arch. Surg. 13: 588, 1926.

(2) McIver, M. A., Redfield, A. C., and Benedict, E. B.: Gaseous exchange between the blood and the lumen of the stomach and intestine. Am. J. Physiol. 76: 92, 1926.

(3) Johnson, C. K., and Mann, F. C.: The effect of anesthetics on gastric tonus and motility with special references to acute gastric dilatation. Surgery 12: 599, 1942.

(4) Golden, R. F., and Mann, F. C.: Effects of drugs used

in anesthiology on the tone and motility of the small intestine. Anesthesiology 4: 577, 1943.
(5) WEBB, A.: Immediate feeding in abdominal surgery. North Carolina M. J. 3: 551, 1942.
(6) MAHONEY, L. E.: Prevention of gas pains. Am. J. Surg. 32: 272, 1936.
(7) HORTON, H. S.: Postoperative intestinal distention. West. J. Surg. 51: 368, 1934.
(8) KUGELMASS, I. N.: Feeding and care for postoperative patients. Mod. Hosp. 59: 61 (December), 1942.
(9) FINE, J., AND LEVENSON, W. S.: Effect of foods on postoperative distention. Am. J. Surg. 21: 184, 1933.
(10) STEELE, J.: The narcotic as a factor in postoperative nausea and vomiting. Anesthesiology 4: 430, 1943.
(11) SMITH, J. M.: Post-operative vomiting in relation to anesthetic time. Brit. M. J. 2: 217, 1945.

OTHER REFERENCES

(1) ADAMS, R. C.: Symposium on anesthesia; venipuncture—neglected subject. S. Clin. North America 25: 792, 1945.
(2) ALVAREZ, W. C.: What causes flatulence? J. A. M. A. 120: 21, 1942.
(3) ALVAREZ, W. C., AND HINSHAW, H. C.: Foods that commonly disagree with people. J. A. M. A. 104: 2053, 1935.
(4) BOEHME, E. J.: Management of intestinal distention (adynamic ileus) with special reference to postoperative distention. S. Clin. North America 24: 560, 1944.
(5) BRIDGES, M. A.: Dietetics for the Clinician. 4th ed. Philadelphia: Lea and Febiger, 1941, pp. 410, 436–438, 507–508, 527–530.
(6) BROSTER, L. R.: Vomiting. Post. Grad. M. J. 19: 96, 1943.
(7) BRUNSCHWIG, A., CLARK, D. E., AND CORBIN, N.: Symposium on abdominal surgery: Postoperative nitrogen loss and studies on parenteral nitrogen nutrition by means of casein digestion. Ann. Surg. 115: 1091, 1942.
(8) COLLER, F. A., DICK, V. S., AND MADDOCK, W. G.: Maintenance of normal water exchange with intravenous fluids. J. A. M. A. 107: 1522, 1936.
(9) DAUM, K.: Diet therapy as especially applicable to surgical diseases. Hospitals 13: 23 (June), 1939.
(10) DAVIES, R. M.: Some factors affecting incidence of post anaesthetic vomiting. Brit. M. J. 2: 578, 1941.
(11) DODD, H.: Postoperative distention of the abdomen. Lancet 2: 98, 1940.
(12) DRAGSTEDT, L. R., AND DRAGSTEDT, C. A.: Acute dilation of the stomach. J. A. M. A. 79: 612, 1922.
(13) DRAGSTEDT, L. R., MONTGOMERY, L., ELLIS, J., AND MATHEWS, W.: Pathogenesis of acute dilation of stomach. Surg. Gynec. & Obst. 52: 1075, 1931.
(14) ELMAN, R., WEINER, D. O., AND BRADLEY, E.: Intravenous injections of amino-acids in postoperative patients. Ann. Surg. 115: 1160, 1942.
(15) ESCH, L.: Therapeutic dietetics in relation to surgery. Hosp. Management 51: 55 (April), 1941.
(16) FANTUS, B.: Fluid postoperatively: Statistical study. J. A. M. A. 107: 14, 1936.
(17) FINE, J., AND STARR, A.: Intestinal distention. Rev. Gastroenterol. 6: 419, 1939.
(18) GRAY, H. K., AND SHARPE, W. S.: Gastric retention after posterior gastroenterostomy for duodenal ulcer: Prevention and treatment. Ann. Surg. 123: 397, 1946.
(19) GUBIN, E. K.: Gaseous indigestion. Hygeia 21: 14 (January), 1943.
(20) HALPERIN, P. H.: Early postoperative feeding. Wisconsin M. J. 39: 94, 1940.
(21) HARTZELL, A., AND CROWLEY, R.: Vitamin therapy in the surgical patient. Am. J. Surg. 56: 288, 1942.
(22) HENDERSON, J.: Flatulent dyspepsia: Its causes and treatment. Practitioner 132: 425, 1934.
(23) JOSEPH, E. G.: New treatment for acute dilation of the stomach. Am. J. Surg. 60: 381, 1943.
(24) KELLY, H. T.: Convalescent care and postoperative management: General principles of convalescent care. Pennsylvania M. J. 48: 792, 1945.
(25) LAKIN, C. E.: Abdominal distention apart from intestinal lesions. Middlesex Hosp. J. 43: 22 (June), 1943.
(26) LAWRENCE, K. B., AND CONNICK, G. S.: Diets in general surgery. Am. J. Surg. 58: 181, 1942.
(27) MCLESTER, J. S.: Nutrition and Diet in Health and Disease. Philadelphia: W. B. Saunders Co., 1943, p. 735.
(28) MUSHIN, W., AND WOOD, H.: Effect of nicotinic acid on postoperative vomiting. Brit. M. J. 1: 719, 1944.
(29) NOVAK, E.: Acute postoperative dilation of the stomach. J. A. M. A. 77: 81, 1921.
(30) ODEN, C.: The treatment of postoperative nausea, vomiting, and distention in certain abdominal sections, by the use of a modified duodenal tube. Surg. Gynec. & Obst. 36: 572, 1923.
(31) OTTENHEIMER, E. J.: Postoperative gas pains. New England J. Med. 213: 608, 1935.
(32) PAINE, J. R., CARLSON, H. A., AND WANGENSTEEN, O. H.: Postoperative control of distention, nausea, and vomiting. J. A. M. A. 100: 1910, 1933.
(33) PARKS, T. J.: Prevention of postoperative distention. Am. J. Obst. & Gynec. 48: 434, 1944.
(34) PUESTOW, C.: Intestinal motility and postoperative distention. J. A. M. A. 120: 903, 1942.
(35) PUESTOW, C.: Postoperative gastrointestinal disturbances. J. Michigan M. Soc. 42: 603, 1943.
(36) RICHEY, C. O.: Gaseous indigestion. J. Indiana M. A. 35: 21, 1942.
(37) SELLMAN, P.: Nausea and vomiting during spinal anaesthesia, especially as influenced by preoperative narcotics. Anesthesiology 2: 333, 1941.
(38) SHAINE, M. S.: Treatment of flatulence. Rev. Gastroenterol. 8: 131, 1941.
(39) SINGLETON, A. O., ROGERS, F., AND HOUSTON, F.: The problem of intestinal gases complicating abdominal surgery. Ann. Surg. 115: 921, 1942.
(40) SOHLBERG, O.: Effects of early postoperative feedings. Minnesota Med. 18: 382, 1935.
(41) STENGEL, A., JR., AND RAVDIN, I. S.: The maintenance of nutrition in surgical patients. Surgery 6: 511, 1939.
(42) TRACTENBERG, I., AND OLIVER, W.: The use of prostigmin in abdominal and vaginal operations for relief of postoperative distention and urinary retention in 96 cases. Am. J. Surg. 53: 284, 1941.
(43) RAVDIN, I. S., AND ZINTEL, H. A.: Nutrition in the care of the surgical patient (preoperative and postoperative). *In* Wohl's Dietotherapy—Clinical Application of Modern Nutrition. Philadelphia: W. B. Saunders Co., 1945, Chap. 42.
(44) VAN LIERE, E. J.: Role of anoxia in gastrointestinal effects. Anesthesiology 5: 400, 1944.
(45) VICTOR, SISTER MARY: Diets useful in preoperative and postoperative care of the patient. S. Clin. North America 20: 1211, 1940.
(46) ZINTEL, H. A.: Preoperative and postoperative care of patients with lesions of the stomach and duodenum. S. Clin. North America 24: 1353, 1944.
(47) ZINTEL, H. A.: The role of nutrition—Review in preoperative and postoperative care. Am. J. M. Sc. 207: 253, 1944.

Terminal Heating of Infant Formula

I. Bacteriological Investigation of Low-Pressure Technique[1]

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Hospitals have devised various methods of preparing and processing infant formula, nursing bottles, and nipples in an attempt to develop a safe procedure. To our knowledge no complete bacteriological study has been made on this subject, and no standard method of preparation has been recommended. The use of a standard procedure which has been proved satisfactory should aid in reducing the hazards of infant disorders in hospitals.

It is the authors' opinion that any method of processing formula should insure the absence of all viable pathogenic micro-organisms from the formula, bottles, and nipples. Furthermore, the processed nursing assembly and formula must be handled in such a manner that recontamination is prevented and growth of non-pathogenic organisms in the formula is reduced to a minimum.

Lembcke (1) investigated the practice of heating formula by immersing the bottles in 2 to 3 in. of boiling water for 20 min. In his opinion this procedure was unsatisfactory and was responsible for an outbreak of infant diarrhea. He revised the technique so that formula bottles were immersed to the neck and pasteurized at 148° to 160° F. for 30 min. The nipples were autoclaved, aseptically placed on the bottles, and protected by a cellophane hood. The necessity for refrigeration of the formula was stressed. After this revision, the diarrhea outbreak ceased.

Merritt, Mike, and West (2) recommended immersion of bottles in a boiling water bath for 30 min. They outlined a complete procedure of making and processing the formula. As in the previous work, the necessity of refrigeration after sterilization was mentioned. The authors gave neither data on the construction of the heating bath nor any bacteriological data.

Bergman (3) advocated the heat treatment of nursing bottles, with the nipple installed and protected by a glass cap, in an autoclave at 7 lb. steam pressure for 20 min. After treatment, the formula was refrigerated until used. No bacteriological data are given in the report.

Rourke (4) called attention to the possibility of transmitting infant diarrhea through faulty nursing technique. Bacteriological tests on formula prepared by aseptic procedures at several hospitals showed that the majority of the formulas contained some micro-organisms. Rourke advocated terminal heating by immersion of the filled nursing bottles in boiling water, followed by water cooling, and he presented data indicating that a 15-min. heating time was sufficient to produce a high incidence of sterility.

It appears to the authors that the terminal heating method of preparing infant formula offers the greatest safety. Aseptic methods depend upon prevention of contamination, and in case of errors in technique, provide no protection against pathogens. Terminal heating, as shown by several investigators (2–4) may be depended upon to eliminate pathogens, and since it is the last step in formula preparation, it precludes the introduction of micro-organisms at a later stage. If terminal heating of infant formula is to be generally adopted, it is necessary that certain aspects of the problem be investigated more fully, particularly the following: (a) The comparative efficiency of low pressure (flowing steam) and high pressure autoclaving methods should be studied. (b) Information should be collected on the effect of heat treatment on various micro-organisms, and definite times and temperatures of terminal heating should be specified. (c) Nipple hoods should be tested to evaluate their efficacy in protecting the

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[2] The authors wish to express appreciation to the officials of the Pet Milk Company for releasing this report for publication, and especially to H. E. O. Heineman, Director, Research Development, for suggestions and counsel in this research. A later report by these authors, to be published in this JOURNAL, will deal with the nutritive values of formula subjected to terminal heating.

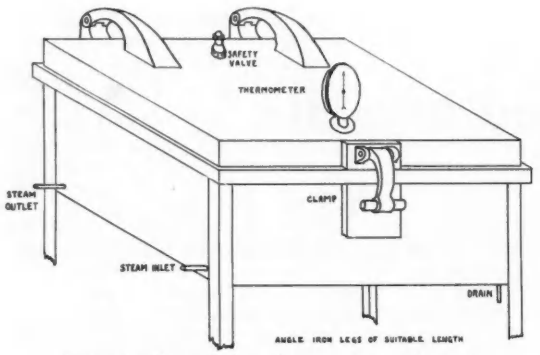


PLATE 1. *General view of processing equipment.*

nipples from contamination during storage periods. (d) Data should be collected on the value of cooling infant formula.

EXPERIMENTAL PROCEDURE

Apparatus

The low-pressure vapor bath used in these experiments (Plates 1 and 2) was rectangular in shape measuring 23 in. in length by 15½ in. in width. It was 9 in. deep and was constructed of 10-gauge sheet metal. The vertical corners were braced with 1 x 1 x ⅛ in. angle irons which were prolonged to serve as supporting legs for the bath. A hinged lid, 2 in. deep, made a vapor-tight seal with the bath by means of a rubber gasket and clamp-type fastener. Accessories included a drain, dial thermometer, and pressure relief valve set at 1 lb. per square inch.

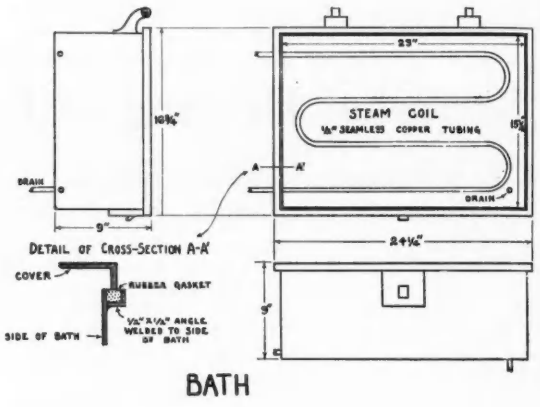
Preliminary experiments led to the abandonment of electrical immersion heaters in favor of immersed steam coils as the method of heating. The steam coil used was made of seamless copper tubing, ½ in. in diameter, and was equipped with the necessary valves and a pressure gauge. It was placed in the bottom of the bath so that it could be covered by a minimum amount of water.

This bath was designed to hold forty-eight bottles of infant formula. The formula bottles were placed in racks which held twelve bottles each. These racks were of sufficient depth to handle 8-oz. bottles, and by placing a false bottom in the racks, 4-oz. bottles were elevated to the same heights as the 8-oz. This arrangement permitted water cooling of the formula without submerging the smaller bottles.

For the purpose of our experiment, sight glasses were inserted in the lid of the apparatus so that temperatures on dial thermometers placed in the bottles of formula could be compared with the temperatures indicated by the bath thermometer.

Formula Unit Assembly

The formula used in this work had the following composition: evaporated milk[3], 8 oz.; water, 16 oz.; and carbohydrate, 1¼ oz. Since the collection of



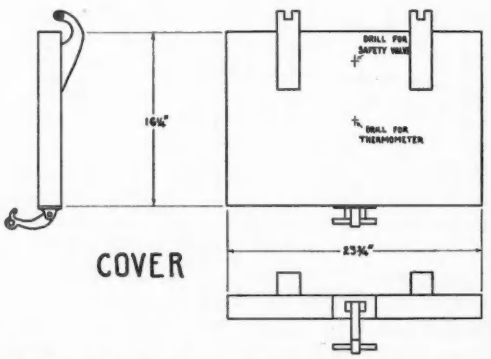


PLATE 2. *Details of construction of bath and cover.*

milk films results in a building up of heat-resistant types of organisms which may live through the sterilization process, it was important that all bottles and nipples be thoroughly cleaned after use.

In this study the nipples were protected from airborne organisms by a prefabricated hood of transparent rubber film. This hood was so shaped that it followed to some degree the contours of the nipple and could not be readily dislodged from the bottle in handling. The hood also permitted circulation of vapor for adequate disinfection of the nipple.

After the formula bottles had been filled and equipped with nipples and hoods, the bottles were placed in the racks, and the filled racks placed in the bath. The steam was then turned on and the terminal heating cycle carried through.

Heat Treatment

Studies on the rate of heat penetration into the formula were made with twenty-four 8-oz. bottles

[3] A series of tests on formula prepared with pasteurized, homogenized milk has shown that low-pressure terminal heating is satisfactory for this product. No significant physical changes could be detected in the formula after heating, whether prepared from evaporated or whole milk.

and twenty-four 4-oz. bottles in the bath. Dial thermometers were immersed in the formula and readings were taken through the sight glasses in the top of the bath. Water vapor served as the heating medium. The temperature of the vapor bath reached 100° C. in 7 to 8 min. after heat was applied, although the formula needed to be held for 7 to 9 min. at the bath temperature of 100–101° C. before it reached 100° C. (Fig. 1). The formula in the 4-oz. bottles required 15 min. from the time heat was first applied to attain this temperature, while in the 8-oz. bottle, 16 min. was required.

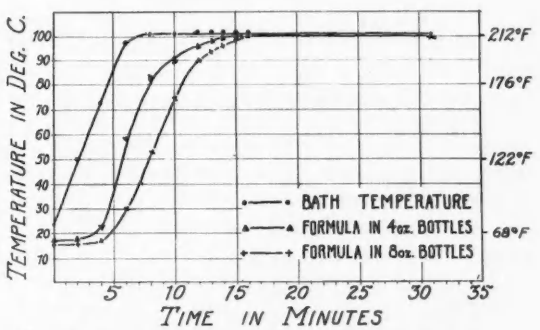


FIG. 1. *Rate of heating of infant formula in water vapor.*

A limited number of tests were made on immersion of formula into boiling water of sufficient depth to reach the neck of the bottle. The water required 13 min. to reach 100° C. At this point the bath was opened, and the formula was placed in the boiling water. Although heat was maintained, the bath temperature decreased to 88° C. and an additional 7 min. were required to bring the formula to the desired temperature.

In both experiments the formula was held at 100° C. for 15 min., making the total time required for the entire process approximately 30 to 35 min.

The steam was then cut off, and the formula bottles were removed to a water bath and held in cold tap water for 20 min. The temperature was reduced by this treatment to 20° to 25°C. (Fig. 2).

Bacteriological Studies

Tests were made of the efficiency of this heat treatment on a regular formula (uninoculated) and on the formula inoculated with substantial numbers of several test organisms.

The organisms selected as contaminants were:

(a) *Escherichia coli* (American Type Culture Collection 26).

(b) *Staphylococcus citreus* (American Type Culture Collection 9510).

(c) *Streptococcus pyogenes* (Lancefield Group A identified by Dr. J. M. Sherman, Cornell University).

(d) *Bacillus globigii* (courtesy Dr. E. V. Hill, Camp Detrick, Maryland).

Escherichia coli was chosen because of ease of identification and also due to the fact that destruction of this organism can be accepted as evidence that the heat treatment would destroy the gram negative organisms involved in enteric infections.

Staphylococcus citreus was chosen as a simulant for the toxin-producing Staphylococci. This pigmented coccus type is readily identified and is comparable in heat resistance to the toxin-producing types.

The organisms causing septic sore throat or scarlet fever are members of the Lancefield Group A. These organisms are readily differentiated from

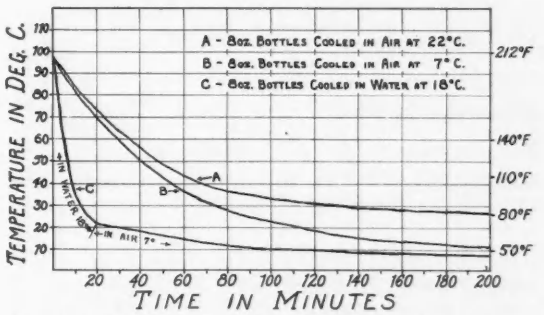

TEMPERATURE IN DEG. C.
A - 8oz. BOTTLES COOLED IN AIR AT 22°C.
B - 8oz. BOTTLES COOLED IN AIR AT 7° C.
C - 8oz. BOTTLES COOLED IN WATER AT 18°C.
212°F
140°F
110°F
80°F
50°F
TIME IN MINUTES

FIG. 2. *Cooling rates of bottles of formula in air and water.*

the heat-resistant forms by their hemolytic action on blood agar. Since we were able to procure a culture of this organism which has been shown by mouse tests to have a low virulence, we elected to use the *Streptococcus pyogenes*.

In order to determine the effect of this heat treatment on spore-forming bacteria, a pigmented organism, *Bacillus globigii*, was selected, the spores of which are moderately heat-resistant.

Inoculation of formula was accomplished by dividing the formula into three beakers, at least two of which were then inoculated, respectively, with a specific test organism. The inoculum, in the case of *Streptococcus pyogenes*, was obtained from a 48-hr. heart infusion broth culture, while all others were derived from 72-hr. agar slant cultures, suspended in physiological saline.

In each heat trial, two different test organisms, as well as uninoculated formula, were represented, or, in later trials, three different test organisms each in an equal number (one-third) of the bottles of formula. The three types of bottles were assorted throughout the racks during terminal heating so that heat treatment on the various bottles would be comparable. After heat treatment and cooling, the bottles containing each type of formula were then subdivided into three lots for sterility tests. Sterility tests were made on the first lot within 2 hr., on the second lot after holding for 24 hr. in a refrigerator at 7° C., and on the third lot after holding at room temperatures (20° to 25° C.) for 24 hr.

Sterility tests included a standard plate count of

TABLE 1

Effect of non-pressure terminal heating (100°C. for 15 min.) on micro-organisms in infant formula

INOCULUM	INITIAL COUNT IN FORMULA	NUMBER OF SAMPLES	NUMBER OF CONTAMINATED SAMPLES/STERILE SAMPLES											
			Immediate test				Refrigerated 24 hr.				Room temperature 24 hr.			
			Formula		Nipples		Formula		Nipples		Formula		Nipples	
			Plate	Incubated sample	Plate	Broth	Plate	Incubated sample	Plate	Broth	Plate	Incubated sample	Plate	Broth
Control	10 to 30	58	0/20	0/20	0/20	0/20	0/19	0/19	0/19	0/19	0/19	0/19	0/19	0/19
Escherichia coli	0.44 to 3.64 × 10^6	57	0/20	0/20	0/20	0/20	0/19	0/19	0/19	0/19	0/18	0/18	0/18	0/18
Staphylococcus citreus	0.05 to 0.90 × 10^6	113	0/42	0/42	0/42	0/42	0/40	0/40	0/40	0/40	0/31	0/31	0/31	0/31
Streptococcus pyogenes	0.12 to 0.40 × 10^6	61	0/23	0/23	0/23	0/23	0/23	0/23	0/23	0/23	0/15	0/15	0/15	0/15
Bacillus globigii	0.6 to 3.7 × 10^6	86	6/26	10/22	0/32	4/28	1/23	6/18	0/24	1/23	3/27	9/21	0/30	3/27

the uninoculated formula and the microscopic examination of a 10-ml. sample after 24 hr. incubation at 37° C. Nipples were aseptically removed to a large mouth flask containing nutrient broth, to which sufficient Bacto Dehydrated Skim Milk was added to make the final concentration 0.5 per cent. After agitation, a 1-ml. sample of the broth was removed fromt his flask and plated on Tryptone Glucose Extract Agar. The agar plates and the flasks containing the broth and nipples were incubated 48 hr. at 37° C. After incubation, the plates were counted, and the broth was examined under the microscope. In preparing slides for microscopic examination, the incubated formula was stained with Newman-Lampert stain and the broth-skim-milk mixture was stained with Crystal Violet.

Formula which had been inoculated with *Escherichia coli* was plated on Endo's agar, that which had been inoculated with *Streptococcus pyogenes* was tested on blood agar, while the others were plated on Tryptone Glucose Extract Agar. Plate counts were made on all samples before heat treatment to insure a heavy inoculation of viable organisms.

To obtain information on the comparative value of various devices for nipple protection when a heavy aerosol of a known organism was set up during storage, we placed nipples on formula bottles and shielded the nipples with (a) standard glass hoods, (b) hoods of prefabricated transparent rubber film, (c) sheet cellophane, and (d) paper drinking cups. The cellophane was cut as a sheet approximately 7 by 7 in. and was tied over the nipple and top of the bottle. The paper drinking cups were the folded type. As a control, a portion of the assembled bottles had no protective device over the nipples. All bottles, after complete assembly, were placed in the vapor bath and heated at 100° C. for 15 min. The bottles were removed from the bath, and sufficient time was allowed for cooling (1 hr.). At the end of this cooling period, a broth suspension of *Serraiat marcescens* was atomized into the laboratory room for a period of 5-min. The nebulizer was 3 ft. from the formula bottles and was directed toward them. Plates were exposed near the racks of bottles for a 1-min. period. The colonies per plate ranged from 780 to 9280. On the completion of this test, the racks of bottles were removed to another laboratory room, and the nipples were aseptically removed and tested following the same procedure described earlier.

RESULTS

Table 1 contains data on the effect of low-pressure terminal heating at 100°C. (212°F.) for 15 min. on micro-organisms in infant formula. In the case of the uninoculated (control) formula prepared with evaporated milk, the organism count prior to heat treatment was in no case greater than 30 organisms per milliliter by the standard plate method. Following terminal heating and water cooling, all formula and nipple surfaces were sterile.

Confirmatory data on the effectiveness of this method are given in Table 1 with respect to formulas inoculated respectively with *Escherichia coli*, *Staphylococcus citreus*, and *Streptococcus pyogenes*. Initial counts in inoculated formula ranged from 50,000 to 3,640,000 organisms per milliliter. It is apparent that the heating process was adequate to destroy these organisms completely in the formula and on nipple surfaces of all samples tested.

The effect of exposure to 100°C. for 15 min. on a heat-resistant spore-forming organism (*Bacillus globigii*) is also summarized on Table 1. Initial counts

of the test organism in the formula were in excess of 600,000 per milliliter. Examination of the table will show that the heat treatment did not, in all cases, produce sterile formula or sterile nipple surfaces, but was sufficient to reduce the viable organisms to such an extent that they could not always be detected by the usual pour plate method, even though 1 ml. was placed directly into the agar. Sterility tests made by incubating 10 ml. of the formula have shown that this non-pathogenic organism may occasionally survive the heat treatment. Counts on formula which has been inoculated with *Bacillus globigii* and heat treated in the water vapor bath indicated that the surviving organisms do not exceed 10 per milliliter. Counts on the water-cooled formula, stored for 24 hr., were comparable to those in formula 2 hr. after processing. On the other hand, the same formula stored at room temperature for 24 hr. contained from 0 to 30,000 organisms per milliliter. Thus, it is essential that the processed formula be stored at a temperature which will prevent growth of any surviving micro-organisms.

TABLE 2

Effectiveness of various nipple hoods against artificial air-borne contamination (heavy aerosol)

PROTECTIVE DEVICE	NUMBER OF SAMPLES	NUMBER OF CONTAMINATED NIPPLES		MAXIMUM CONTAMINATION PER NIPPLE
		Agar plate	Broth	
Glass	19	4	4	2400
Transparent rubber film	20	4	9	4000
Cellophane	20	9	14	5000
Paper cup	19	6	14	6000
No protection	18	18	18	10,800

Examination of Table 1 indicates that those formula bottles which were held for 24 hr. did not show a greater frequency of nipple contamination than those which were plated within 2 hr. after the heat treatment. This indicates that the hood of prefabricated transparent rubber film used in this work adequately protected the nipples from air-borne contamination during storage.

The data in Table 2 show that the various types of nipple hoods tested provided some protection even against a heavy aerosol, and that the variation in effectiveness was not great. There appeared to be a slight superiority of the glass and prefabricated hoods over the other methods of nipple protection tested. The data indicated that none of the nipple hoods tested can be relied upon to offer complete protection from aerosols. The hospital should, therefore, make an effort to prevent exposure of processed bottles of formula to conditions where the count is excessive of air-borne organisms.

SUMMARY

A low-pressure water vapor terminal heating procedure which maintained infant formula at 100° C. (212° F.) for 15 min. produced the following results:

(a) Sterilization of a regular evaporated milk formula and of nipple surfaces in the case of all samples tested.

(b) Complete destruction of *Escherichia coli*, *Staphylococcus citreus*, and *Streptococcus pyogenes* when formulas were inoculated with substantial numbers of these test organisms.

(c) Another test organism, *Bacillus globigii*, a non-pathogenic heat-resistant, spore-forming aerobic bacillus, was completely destroyed in the majority of samples, and in the remainder was reduced to counts below 10 organisms per milliliter.

This terminal heating method has been found to be satisfactory for either evaporated or whole milk. No significant physical changes in the formula were observed.

Nipple hoods furnished substantial protection from air-borne organisms, but cannot be relied upon for complete protection from a heavy aerosol.

The advantages of a nipple hood of prefabricated transparent rubber film have been demonstrated.

REFERENCES

(1) LEMBCKE, P. A.: Imperfect sterilization of nursing nipples and formula as a possible factor in transmission of epidemic diarrhea of the newborn. Am. J. Hyg. 33 (Sect. A): 42, 1941.

(2) MERRITT, K. K., MIKE, E., AND WEST, I. W.: A simplified method of preparing infants' formulas. J. Am. Dietet. A. 19: 340, 1943.

(3) BERGMAN, S. M.: Life begins in safety in this remodeled nursery. Modern Hospital 66: 48 (January), 1946.

(4) ROURKE, A. J. J.: Infant formulas. 1. Study of methods now used. 2. Preparation techniques. Hospitals 21: 65 (May), 66 (June), 1947.

Taste Perception in Men and Women

Reporting on the results of a survey made at Drexel Institute of Technology in Philadelphia, Dr. Katheryn E. Langwill, Professor of Nutrition, College of Home Economics, indicated that young women have a sharper food taste than men. All participants in the experiment were between the ages of seventeen and thirty. Five slips of paper were tasted: one was blank, while the four others had been dipped in sweet, salt, sour, and bitter solutions. Perfect scores were made by 77 per cent of the 257 women, a feat duplicated by only 46.7 per cent of the 242 men. The conclusions derived from this study are as follows: (a) More than 50 per cent of both men and women preferred moderately sweet and salty foods. (b) More women than men preferred excessively salty and sour foods. (c) More than 50 per cent of the men liked slightly sour food.—*From Chicago Tribune, June 19, 1948.*

Terminal Heating of Infant Formula

II. Bacteriological Investigation of High-Pressure Technique[1]

R. D. FINLEY, F. R. SMITH, and E. A. LOUDER[2]
Pet Milk Research Laboratories, Greenville, Illinois

IN A previous report (1), the authors presented data on the effectiveness of low-pressure terminal heating of infant formula and recommended a standard method for routine hospital use.

At present there seems to be no standard procedure in hospitals for the treatment of formulas at higher steam pressures. One finds a variety of times and temperatures being used and a comparable variation in the results achieved, in terms of bacteriologic safety or physical condition of the resulting milk mixtures. The purpose of this study was to develop data upon which to base a prescribed high-pressure terminal heating procedure and to determine its effectiveness by routine application of the treatment to infant formulas.

EXPERIMENTAL PROCEDURE

The infant formula used routinely in these studies had the following composition: evaporated milk[3], 8 oz.; water, 16 oz.; carbohydrate, 1¼ oz. Methods of preparation of formula and of assembling the complete formula unit were the same as in the previous study (1). Clean (not aseptic) technique was employed.

A series of tests was made on the thermal death times of a variety of micro-organisms suspended in infant formula. A small amount of formula (1½ ml.), inoculated with a test organism, was sealed in a glass tube with a wall thickness of 1 mm. and an outside diameter of 1 cm. In a similar tube of formula, a copper-constantan thermocouple was placed. The tubes were completely immersed in an oil bath with a mercury-type thermo-regulator. The temperature of the bath was raised and the death rate of the organisms measured. Based on the results of these tests (Table 1), in order to provide a reasonable margin of safety, an autoclaving treatment of 110° C. (230° F.) for 10 min. was selected.

Studies were made of comparative temperatures and rates of temperature rise in the autoclave and in the formulas using thermocouples inserted in the formula bottles and held in the mid-portion of the formula fluid.

Numerous tests were made of the efficiency of the terminal heating procedure. Regular formula was routinely tested, also formula inoculated with test organisms. Non-spore-forming organisms were not used because of their comparative ease of destruction. Rather two, non-pathogenic organisms were used: *Bacillus subtilis* (American Type Culture Collection 6633) and *Bacillus globigii* (courtesy of Dr. E. V. Hill, Camp Detrick, Maryland), spores of which are moderately heat-resistant. Inoculation was accomplished by suspending agar slant cultures in 10 ml. of sterile water and adding this suspension to the desired volume of formula.

Each autoclave load contained equal numbers of 8-oz. and 4-oz. bottles of formula, one-third of which were uninoculated and two-thirds of which had been inoculated. Autoclaving was carried out at 230° F. (approximately 7 lb. pressure) for 10 min.

All batches of formula were tested bacteriologically by both plate and broth techniques (a) immediately after autoclaving, (b) after storage for 24 hr. in the refrigerator, and (c) after holding for 24 hr. at room temperature.

To determine the protective value of nipple hoods under autoclave conditions in all tests described above, the nipples were protected by various types of hoods, including glass, prefabricated transparent rubber film, cellophane (tied on), and paper hoods. At the time of sampling the formula, nipples were aseptically removed and placed in wide-mouth flasks containing glucose nutrient broth to which 1.5 per cent skim milk powder had been added. The flasks were incubated for 48 hr. at 37° C. and examined under the microscope for viable organisms.

[1] Received for publication May 1, 1948.

[2] The authors wish to express appreciation to the officials of the Pet Milk Company for releasing this report for publication, and especially to H. E. O. Heineman for suggestions and counsel in this research.

[3] Bottled whole milk was substituted for evaporated milk in several trials, with a terminal heat treatment of 230° F. for 10 min. The bacteriological and physical condition of the formula was satisfactory.

TABLE 1

Thermal death studies on organisms suspended in infant formula

TEMPERATURE	TIME REQUIRED TO REACH TEMPERATURE	INOCULUM	INITIAL COUNT	KILLING TIME
degrees F.	*min.*			
212	2½	*Bacillus subtilis*	35×10^4	12 min.
		Bacillus globigii	48×10^6	13 min.
		Escherichia coli	22×10^7	45 sec.
		Streptococcus citreus	32×10^6	30 sec.
		Staphylococcus aureus	45×10^6	45 sec.
221	3	*Bacillus subtilis*	29×10^4	6 min.
		Bacillus globigii	70×10^6	8 min.
		Dried soil	32×10^2	10 min.
230	3	*Bacillus subtilis*	24×10^4	4 min.
		Bacillus globigii	22×10^6	4 min.
		Dried soil	49×10^2	6 min.

In the foregoing studies, all equipment for formula units and all utensils were thoroughly cleaned. It seemed important to demonstrate also the effects of poor cleaning procedure upon the quality of infant formula which was processed at 230° F. for 10 min. Therefore, the first samples of formula were also processed in clean equipment. Following this, the mixing utensils and bottles were emptied, rinsed, and permitted to stand overnight. On the following day, these were used without further cleaning in the preparation of formula. This poor technique was repeated for six consecutive days.

RESULTS AND DISCUSSION

Table 1 shows the thermal death times for different test organisms, including unidentified species in road dust, suspended in infant formula. It is apparent that the organisms, *Escherichia coli*, *Staphylococcus aureus*, and *Staphylococcus citreus*, were killed before the temperature had reached 212° F. The non-spore-forming organisms, therefore, present no problem in pressure heat treatment of infant formula. The spore-forming organisms, *Bacillus subtilis* and *Bacillus globigii*, as well as the unidentified species of road dust, are more difficult to destroy. Exposure to 230° F. for a brief period (4 to 6 min.) accomplished this.

In Figure 1, the comparative temperatures and rates of rise in the autoclave and in the formulas are indicated. Curves A and B show, respectively, the temperature in the autoclave and in the formula when 8 min. were allowed for the autoclave to reach a pressure of 7 lb. (232° F.) and the autoclave temperature held at 230–232° F. for 10 min. The temperature of the formula reached 230° F. for 8 min. and the autoclave temperature was held at

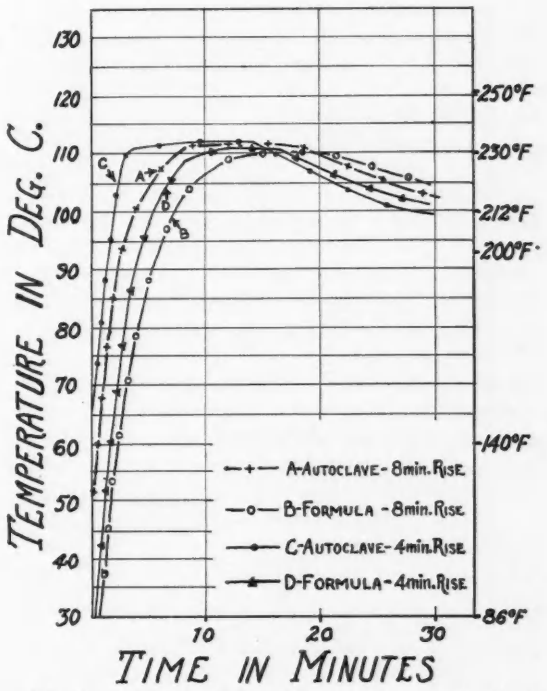


FIG. 1. *Autoclave and formula temperatures during heating cycle.*

230° F. per 10 min. and remained above 229° F. for 10 min.

When the autoclave "come-up" time was shortened to 4 min., as shown by curves C and D, the formula reached a temperature of 230° F. for approximately 6 min. and remained above 229° F. for 7 min. Thus, a too-rapid rise in temperature of the autoclave to the processing range decreased the exposure time of the formula at the desired temperature. In the processing of infant formula, it is, therefore, essential that the operator rely upon temperature, not on pressure in the autoclave. Without means of measuring temperature, an insufficient degree of heat may result. Furthermore, the time-temperature relationships shown in Figure 1 depend upon adequate circulation of steam between bottle surfaces, as provided by wire racks. When bottles are tightly packed, heat transfer is less efficient and different results are obtained.

The results of the survey to determine the bactericidal efficiency of this terminal heating procedure are given in Table 2. Contamination was detected in only one of 302 samples by the broth sterility test. By the agar plate method, all formulas were sterile. It is apparent that the heating process was adequate to destroy completely the test organisms, *Bacillus subtilis*, *Bacillus globigii*, and unidentified species in road dust. Inasmuch as the one unsterile sample was among the control samples, it is considered likely that it was contaminated during testing. These

TABLE 2

Sterility tests on formula processed for 10 min. at 230°F.

INOCULUM	NUMBER OF BATCHES	NUMBER OF SAMPLES	NUMBER OF CONTAMINATED SAMPLES/ STERILE SAMPLES					
			Immediate test		Refrigerated 24 hr.		Held at room temperature 24 hr.	
			Plate	Broth	Plate	Broth	Plate	Broth
Control	13	97	0/32	0/32	0/31	0/31	0/34	1/33
Bacillus subtilis	13	102	0/34	0/34	0/34	0/34	0/34	0/34
Bacillus globigii	12	94	0/31	0/31	0/31	0/31	0/32	0/32
Dust	1	9	0/3	0/3	0/3	0/3	0/3	0/3
Total....	13	302	0/100	0/100	0/99	0/99	0/103	1/102

TABLE 3

Protective value of nipple hoods

TYPE OF HOOD	NUMBER OF TESTS	TESTED IMMEDIATELY		REFRIGERATED 24 HR.		HELD AT ROOM TEMPERATURE 24 HR.	
		Number tested	Sterile	Number tested	Sterile	Number tested	Sterile
			%		%		%
Paper hoods	159	54	42.6	48	56.2	57	8.7
Glass	46	15	60.0	15	40.0	16	50.0
Cellophane (tied on)	48	12	25.0	18	55.5	18	44.4
Prefabricated transparent rubber film	162	54	85.1	54	92.6	54	81.4

tests indicate that exposure of infant formula to a temperature of 230° F. (moist heat) for 10 min. is adequate terminal heating.

Processing of the formula at 230° F. for 10 min. produced discernible browning. It is doubtful, however, if this was sufficient to warrant criticism of the method. At no time was any physical breakdown observed in the processed formula. It, therefore, seems unlikely that any sufficient physical changes would be produced by this treatment that would cause difficulty with nipple clogging. It has been the experience in these studies that nipple clogging resulted from the boiling over of formula due to too-rapid exhaust of autoclave pressure. Even when pressure was decreased slowly, some difficulty was encountered due to boiling. Observations were made on the effect of processing at a higher temperature (239° F.) on the formula. The browning effect was proportionately more severe and was considered objectionable.

The comparative protection of the nipples afforded by glass, prefabricated transparent rubber film, cellophane, and paper hoods is shown in Table 3. In order to interpret these results, an explanation is necessary of the behavior of the different types of hoods under the conditions of this experiment. The paper hoods were not moisture proof and thus tore easily when wet. The glass hoods, although satisfactory in most respects, did not protect adequately the lower portion of the nipple. Moisture collected at the interface between the glass hood and the nipple, which was undesirable. There is little doubt that the tied-on cellophane provided excellent protection. However, the accuracy of the test with this material was impaired because of the sticking of the material to the nipple after heating. The prefabricated transparent rubber film hood was superior to the others tested in this experiment. This material is impermeable to moisture and did not adhere to the nipples. Occasionally the skirt of the hood clung to the shoulder of the bottle but not to an extent to impair its usefulness.

TABLE 4

Effect of unclean equipment on efficiency of terminal heating of infant formula at 230°F. for 10 min.

NUMBER OF SAMPLES	CLEANING PROCEDURE	STORAGE TIME	NUMBER OF CONTAMINATED SAMPLES/ STERILE SAMPLES	
			Plate	Broth
24	Washed	None	0/24	0/24
24	Rinsed	None	0/24	7/17
24	Rinsed	None	0/24	3/21
24	Rinsed	None	0/24	3/21
24	Rinsed	None	0/24	2/22
24	Rinsed	None	0/24	5/19
24	Rinsed	24 hr. at 80°F.	11/13*	12/12

* Counts ranged from 3 — TNC (3000) per ml.

The results of this study indicated that nipple covers used during high pressure terminal heating provide appreciable protection of nipple surfaces against air-borne contamination during subsequent storage of infant formula. The degree of protection, as judged by these data, was not as great as was achieved by such covers when used in low-pressure terminal heating with flowing steam (1).

Table 4 shows the contamination resulting from the use of poorly cleaned utensils. It is apparent that improper cleaning may lead to the development in the formula of heat-resistant organisms which survive terminal heating. The processing temperature was sufficient to kill most of these organisms, as shown by the fact that tests by the agar plate method did not reveal contaminated samples. The broth sterility test, however, indicated that approximately 20 per cent of the formula had not been completely sterilized.

Perhaps the most significant information in Table 4 is that which shows the effect on these formula, which were prepared in unclean equipment, of storage at room temperature for 24 hr. Here there was a sufficient holding period at a favorable temperature to permit the organisms which survived the heating

period to multiply. Under these conditions, 50 per cent of the samples were found to be unsterile, and all but one of these samples were detected by the agar plate method.

This information stresses an important part of formula preparation. Terminal heating procedures are not designed to replace careful preparation of formula. Although these procedures remove the necessity of aseptic preparation, the personnel entrusted with this operation must use satisfactorily clean methods. Unclean bottles and dirty utensils are some items which may lead to unsterile formula.

Examination of the data throughout this report shows that storage in the refrigerator is preferable to storage at room temperature. When the formula is held at 40° F., any heat-resistant organisms which may survive the heating operation do not multiply to any great degree during the holding period. Thus, for the best procedure, it is recommended that all formula be prepared under clean conditions, be submitted to satisfactory terminal heating, and be held in the refrigerator until used.

SUMMARY

Thermal death studies have shown that common air-borne contaminants are destroyed by a temperature of 230° F. in less than 4 to 6 min.

By means of thermocouples, data have been collected on the comparative rise of temperature in the autoclave and formula bottles during terminal heating.

Sterility tests on formula processed at 230° F. for 10 min. have shown that this treatment is adequate for the terminal heating of infant formula. Observations of the processed formula also indicated that no significant physical damage was sustained as the result of this processing.

Nipple covers, when used during autoclaving of assembled formula units, provided appreciable protection of nipple surfaces against air-borne contamination during subsequent storage of the formula. Of the nipple hoods tested, those of prefabricated transparent rubber film were found to be superior.

Improper cleaning of bottles caused the development of heat-resistant organisms which survived autoclaving at 230° F. for 10 min. and resulted in contaminated formula.

REFERENCE

(1) Smith, F. R., Finley, R. D., Wright, J. H., and Louder, E. A.: Terminal heating of infant formula. 1. A bacteriological investigation of low-pressure technique. J. Am. Dietet. A. 24: 755, 1948.

Discovery of Anti-Peptic Ulcer Factor

"Vitamin U," an anti-peptic ulcer factor, has been discovered by Dr. Garnett Cheney, scientist at the Stanford University School of Medicine in Palo Alto, California. Found in raw foods and milk, this nutrient is destroyed by heat. In order to test the new factor, Dr. Cheney produced ulcers in guinea pigs by giving them histamine, which aroused a heavy flow of digestive fluids. The animals were then fed different diets to test their effectiveness in preventing ulcers. One group was given a diet made deficient in "Vitamin U" by heating; the other group was given the same diet, unheated, and supplemented with liberal amounts of fresh cabbage and milk. It was found that 87.5 per cent of the group getting the heated diet had ulcer lesions which were fatal in all but two cases. On the other hand, none of the guinea pigs on the raw-protective diet had ulcers. Experiments were carried out on two other groups of guinea pigs, with similar results.

In view of the fact that the anti-ulcer factor seems to be so readily destroyed by heat, the possibility is presented that the increasing number of patients with peptic ulcers may, in part, be due to the heat processing of their food supply and their small intake of raw foods. Dr. Cheney suggests that only a long series of closely observed dietary studies on patients with chronic recurrent peptic ulcer can determine the value of raw foods in the treatment of the disease.—*From Food Field Reporter, July 5, 1948.*

Cancer among Diabetics

From previous clinical reports, it has appeared that there was a positive association between cancer and diabetes. However, the evidence has been open to statistical objection due to the possible bias introduced by the selection of a special population, e.g., hospital patients, and by the lack of consideration of age, sex, color, and the period of observation. Furthermore, comparable control groups have not been studied.

A recent statistical study has been made by Paul Jacobson in which an attempt was made to eliminate most of these objections. In spite of this, the evidence still seems to indicate that the incidence of cancer is higher among diabetic than among non-diabetic individuals. Dr. Jacobson reports that diabetic patients are found to have at least one-third more cancer deaths than expected during the ten-year period from 1929–38. No conclusion is given to explain the excess prevalence of cancer among diabetic persons.—*Abstracted from "A Statistical Study of Cancer among Diabetics" by Paul H. Jacobson in The Milbank Memorial Fund Quarterly 26: 91 (January), 1948.*

Epidemiological Aspects of Amoebiasis[1]

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THIS paper will outline briefly some of the epidemiological aspects of amoebiasis in the state of Tennessee with emphasis on the possible role played by the food handler. Although reference is made to dysentery in some of the most ancient medical writings, it was not until 1859 that attention was called to possible amoebic origin of the disease. At this time Lambl found amoeba in the intestine of a child who died of enteritis. In 1875, Losch not only found amoeba in the feces during life of an individual suffering from chronic dysentery, but he also found amoeba in intestinal lesions at autopsy. Losch called this organism *Amoeba coli* and was able to produce infection in a dog by rectal injection of material containing the parasite. This stimulated the interest of many other workers, and in 1891 Councilman and Lafleur reported complete studies of fifteen cases of amoebic dysentery. After studying the histopathology, they concluded that amoebic dysentery was a distinct disease. However, there were other amoeba in the intestinal tract, and it was not until 1903 that differentiation was made between *Endamoeba histolytica* and *E. coli*, the latter thought to be a harmless commensal living in the lumen of the intestine. Schaudinn made this contribution and extended our knowledge by giving good morphological descriptions of the two parasites. Since that time many workers have contributed to the tremendous fund of information which is now available concerning the disease of amoebiasis and related intestinal parasites.

DISTRIBUTION OF AMOEBIASIS

Amoebiasis is world wide in its distribution, but in general it is more prevalent as one goes toward the equator and in the less sanitated areas of the world. Although it is usually considered a disease of the tropical and subtropical countries, its importance in temperate climates was emphasized by the Chicago epidemic of 1933. In this epidemic alone there were about 1400 reported cases with 52 deaths. It would be difficult to estimate the number of unreported cases of the same origin or spread from those cases.

There have been many surveys in various parts of the world, and the incidence of infection of *E. histolytica* is so variable in different geographical locations that to make a general statement of rate of infection would be misleading. However, in the United States the infection rate is generally considered to be about 10 per cent. Even here it varies a great deal with the geographical location.

FORMS OF AMOEBA CAUSING DYSENTERY

E. histolytica may be found in the feces in three morphological forms as shown in Figure 1. The trophozoite (*T*, Fig. 1) is the vegetative, feeding stage of the organism. This is the stage that one finds invading and destroying of the tissues, and in acute cases of dysentery trophozoites may be found in the feces. It is also the reproductive form and sometimes may simply maintain itself in the lumen of the intestine without evidence of harm to its host. The precystic form (*Pc*, Fig. 1) is merely a transitional stage between the trophozoite and the final or third form, the cyst (C_1, C_2, and C_3, Fig. 1 represent progressively maturing cyst forms). The mature cyst (C_3, Fig. 1) is a resistant stage which functions mainly in the process of getting from one host to another. It is rugged enough to withstand many environmental changes outside of the body and when taken into the digestive tract it is able to pass unharmed through the stomach and into the intestine of the new host.

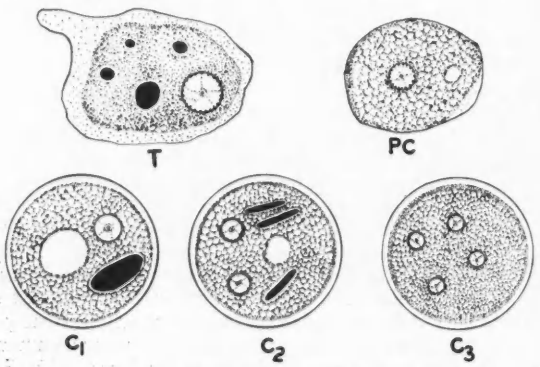

FIG. 1. *Diagramatic drawings of the various stages of E. histolytica.*

[1] Presented at the Annual Meeting of the Tennessee Dietetic Association held in Memphis, on March 6, 1948.

It can be readily seen, then, that the life cycle of the amoeba is a relatively simple one. When mature cysts are ingested, they pass through the stomach and into the lower part of the small intestine where the cyst wall disintegrates, liberating a four-nucleated amoeba. This in turn divides and produces eight small amoeba. These pass on into the large intestine where they multiply and sometimes invade the tissues as trophozoites. Some of these may again encyst, or some of the trophozoites from the tissues may leave the tissues and encyst and then be passed out of the body in the feces. Once the organism invades the tissues, it may travel by way of the blood stream to the liver, lungs, brain, or other organs and produce abscesses which often prove difficult if not impossible to treat adequately.

SOURCES OF INFECTION

Infection originates in the human being through fecal contamination of food and water or by flies and other insects carrying cysts from feces and depositing them on food. Probably the most important source of human infection is contaminated water, especially in the United States. The two Chicago epidemics (1933 and 1934) are instances of water-borne epidemics. The first was due to faulty plumbing in two hotels, and the second was the result of firemen drinking contaminated water at a Union Stockyard fire. There were about one hundred cases of amoebic dysentery developed in the latter group.

Flies and other insects may be a source of local epidemics or infections of isolated individuals. It has been shown that flies can take cysts into their digestive tract and pass them unharmed anywhere from 5 min. up to 48 hr. after feeding. Frye and Meleney (1) caught infected flies in four of twelve houses where infected individuals lived. It would be a simple process in a house of this kind, where there is little or no fly control, for the flies to leave droppings containing cysts on moist food which would be consumed by uninfected people of the household.

Cockroaches are another possible means of spreading amoebiasis. Several authors have reported that cysts of amoeba will remain viable for at least 48 hr. in the intestine of the roach. However, roaches are probably less dangerous because they are more limited in their range of activity. The roach is more apt to remain close to a source of food while flies pass rather quickly from the privy to the kitchen, especially at meal time.

There is one other method of transmission of intestinal parasites which should be mentioned, but one with which we in this country do not have much concern. In many countries, especially in the Orient, human excreta is used for fertilizing vegetable gardens. When vegetables from these gardens are eaten raw, there is a good possibility that they may be a source of amoebic infection. It is encouraging to know that in some areas where the practice of using "night soil" is prevalent, an effort is being made to treat the feces in such a way as to destroy the parasites before it is used for fertilizer. If this is carried out to any large extent, it may not only reduce the amount of amoebiasis but the incidence of many other parasites which can be transmitted in this way.

THE FOOD HANDLER AS A CARRIER

What is the role of the food handler in the transmission of amoebiasis? Although most authorities agree that the food handler may play an important part in the transmission of this disease, it is still a debatable question as to how much and how often. Several people have conducted experiments in an effort to settle this question and I would like to discuss some of these observations. Charles F. Craig, one of the outstanding epidemiologists in the field of amoebiasis, in an article published in the American Journal of Public Health in 1935 (2) stated: "The contamination of food and drink by food handlers, who are passing the cysts of *E. histolytica*, the so-called 'carriers,' is undoubtedly the most common and most important method of transmission in many localities and certainly so in towns and cities having an impounded water supply and where sanitation is otherwise excellent. Food handlers in our hotels, restaurants, lunch counters, roadside refreshment stands, and other places where food is handled and sold, are the chief sources of amoebic infection . . . and it may be stated that the contamination of food and drink handled by infected food handlers is practically a certainty unless the greatest care is taken regarding personal hygiene and the cleanliness of the hands of those who handle the food."

Spector and Bulky (3), in an effort to determine the viability of cysts on contaminated hands, found that all cysts were dead after a short period on hands artificially contaminated and permitted to dry. In a later experiment, Spector and co-workers (4) tried to determine what might happen under more normal conditions. When they found carriers, they would ask them to come into the laboratory and pass a stool specimen there. Before the subjects had a chance to wash their hands, they were asked to rinse them in sterile saline and then clean their fingernails with sterile toothpicks. The washings and cleanings were then concentrated and examined for the presence of amoebic cysts. Out of seventy-four persons thus examined, the hand washings of five or 6.8 per cent were found to be positive. These workers concluded that, in the light of their findings, few people whose stools are known to contain living amoebic cysts contaminate their hands enough to transmit the disease even immediately after defecation.

Sapero and Johnson (5) thought that a more promising approach to the problem would be to examine a number of people who were being served

food and drink by carriers of *E. histolytica* and try to determine if the incidence increased in those people consuming the food. As a control group, they examined a large number of recruits entering the Navy and found the infection rate among this group to be 11.3 per cent. This seemed to agree fairly well with Craig's rate of 11.6 per cent for the general population of the United States. These authors found a rate of 14.7 per cent among recruits from the southern United States and 7.8 per cent among men from other parts of the country. They assumed then that the rate in the Navy would range between 8 and 15 per cent. They examined men from different Navy messes, some having infected food handlers and some in which the food handlers were free from amoebic infection. In the former group, there were eleven messes with 113 food handlers, twenty of whom were carriers of *E. histolytica*. From these eleven messes, there were 196 men served, and of these there were 8.7 per cent infected. From the group where food handlers were free from amoebic infection, there were eight messes with fifty-eight food handlers serving 149 men. None of the food handlers were carriers, and the infection rate among the people being served was 11.4 per cent. Since the expected rate among the Navy men was between 8 and 15 per cent, the two groups fell well within the expected range and the authors concluded that the food handler had little or nothing to do with the rate of infection of the people they served.

Study of an Isolated Tropical Community

In contrast to the above experience, Schoenleber (6) reported some observations made on a group of approximately 1500 Americans living in an isolated camp on the island of Aruba. These people lived in a modern village, constructed by an oil company, which was so situated that it was practically impossible for anyone to be exposed to amoebic infection outside of the camp. About one-third of the group ate in company messes, while families had their own eating arrangements. The cooks and chief steward of the company mess were from the United States, but most of the other food handlers were natives or other people who had lived in the tropics for many years. Most of the families had native servants. The water supply and sewage disposal were such that there was no possibility of infection from these sources. There were practically no flies or other insects which might be responsible for transmission. The camp had been established for about six years before the American company for which Schoenleber worked took over the management.

The medical department immediately made surveys for intestinal parasites and found the infection rate of *E. histolytica* among the people to be 25.57 per cent, and 33 per cent of the food handlers were carriers. This high percentage was based on one stool examination. The stewards were instructed to have the food handlers wash their hands and clean their fingernails carefully before going to work and after each visit to the toilet. Families were instructed to have their servants do likewise. All food handlers found to be positive were not permitted to work until they had been treated and their stools found to be negative. With these precautions alone, the infection rate was reduced in a three-year period to 1.92 per cent of the population of the camp. The author came to the conclusion that the food handlers were the principal source in the transmission of amoebiasis in this camp.

There are a few factors in the above observations which must be taken into consideration before we draw conclusions concerning them. Although Sapero and Johnson (5) pointed out that conditions aboard a naval vessel are crowded and, therefore, it is sometimes difficult to maintain good sanitary measures, we know that all men in the Navy are held to fairly high standards of personal hygiene and especially those who handle food. We know, too, that the galleys and messes of the services are inspected frequently and any signs of lack of sanitary procedure is quickly righted.

Before the American company took over the camp in Aruba, there were few if any precautions taken in the handling of food. Schoenleber was told there was no need for concern about intestinal protozoa because there was little if any infection present. However, when the survey showed such a high incidence of *E. histolytica*, it was felt that some measures should be instigated very quickly. In view of the fact that this was a fairly stable population, Schoenleber thought that, from experience in other similar camps, the personal hygiene of the food handlers was very important and so this was the first measure taken to reduce the infection rate. Since, after one year, the infection rate had been reduced 50 per cent, no other measures were instigated. In addition to the above precautions, inhabitants of the community may have become conscious of intestinal parasites which resulted in improvement of their own hygienic habits; thus this factor also may have played a part in the reduction of the infection rate.

Up to the present time at least, the weight of evidence seems to be against the food handler who is a carrier of *E. histolytica*. It is, however, well recognized that the infected food handler with good personal hygienic habits is not a menace to those whom he serves. Most authorities also agree with the idea that known infected food handlers should be treated, thus eliminating the possibility of transmission.

PROBLEM OF INTESTINAL PARASITES IN TENNESSEE

In December, 1928, a survey was started to determine the incidence of intestinal parasites in the state of Tennessee. The work was being done by three cooperating agencies: The Department of Pre-

ventive Medicine of Vanderbilt University, the State Department of Health, and the Department of Helminthology of the Johns Hopkins University. This survey lasted over a period of several years, and many aspects of the problem of intestinal parasites were studied. This discussion will be limited to the part concerning intestinal protozoa and particularly to *E. histolytica*. The survey was comprehensive and unique in that the people sampled were living in their homes in a natural environment. The work was limited mostly to rural sections, to people living on farms and in small communities. In some areas whole families were studied, and in two instances entire communities were surveyed and various phases of the problem were studied.

I would like to summarize and discuss briefly some of this work. The first report was made by Meleney in 1930 (7). At that time, there had been 4987 specimens examined; 2759 (55.3 per cent) were positive for one or more intestinal protozoa. A break down of the infection rate is shown in Table 1.

The figures in Table 1 are estimates based on one stool examination. Since on certain groups where six specimens were examined, it was shown that 49 per cent of the positives were found on the first examination, the actual rates of infection found on one examination were doubled to establish a more accurate rate. One of the most interesting parts of this report was a study of five families. As can readily be seen from Table 2, the mother in three cases was infected, and the author concluded that since she was the chief food handler she was probably instrumental in passing the infection on to at least some of the other members of the family.

The second report on the survey, made by Meleney, Bishop, and Leathers in 1932 (8), gives a much broader view of the picture. At this time they had surveyed sixty-nine counties and examined 20,237 specimens or about 1.7 per cent of the total rural population. The state was divided into four sections from east to west, and good samplings were obtained from each section. The incidence of *E. histolytica* for the four sections were as follows: East—11.7 per cent, East Middle—15.9 per cent, West Middle—9.8 per cent, and West—6.8 per cent. Again I would like to point out that these figures were based on one examination and that the actual incidence would probably be about twice that amount. It will be noted that the East Middle Section had the highest incidence, and it may be of some interest that this region was the most sparsely settled of any of the areas surveyed. The authors point out that the region represents a section of the state which has the least access to the outside world and hence the people live under more primitive conditions than elsewhere. In the more densely populated areas, there are apt to be more cities of considerable size and usually more sanitary facilities are available. Such people, in general, will have more chance for the safeguards of public health.

TABLE 1

Infection rate in Tennessee due to various protozoa (7)

TYPE OF PROTOZOA	INCIDENCE %
Endamoeba histolytica	17.3
Endamoeba coli	31.7
Endolimax nana	9.8
Iodamoeba butschlii	5.8
Chilomastix mesnili	3.8
Giardia lamblia	18.9

TABLE 2

*Environmental study of families and the relation of mothers to high incidence of E. histolytica**

FAMILY SITUATION	FAMILY A	FAMILY B	FAMILY C	FAMILY D	FAMILY E
Number in family	5	6	7	4	5
Carriers of *E. histolytica*	5	6	4	4	4
Number with history of bloody diarrhea	5	6	3	2	1
Member of family with earliest history of *E. histolytica*	Mother	Mother	Mother	Father	Father
Nutritional status of family	Poor	Good	Fair	Good	Fair
Intelligence level of family	Fair	Good	Poor	Fair	Poor
Personal sanitation of family	Poor	Poor	Poor	Fair	Poor
Water supply (well)	Drilled	Drilled	Drilled	Dug	Drilled
House screened	Yes	No	No	No	No
Flies in house	Few	Many	Many	Many	Many
Privy	Open back	None	None	Good	None
Mother's stool examination					
1	4	2	0	4	2
2	3	1	3	4	4
3	4	1	2	4	4
4	4	2	1	4	1
5	3	0	1	0	4
6	4	0	0	4	3

* Modified from Meleney (7).

This survey included both the white and Negro populations, and it was found that there was very little difference in the infection rate of the two races. In thirty-eight counties where specimens were taken from both races, the incidence for *E. histolytica* was 8.6 per cent for whites and 9.2 per cent for Negroes.

Intensive Study of One Rural Community

The one other report of this survey to which attention should be called is that in which Milam and Meleney (9) reported on an intensive study in one rural community. This was a community in Jackson County, comprised of seventy-five families with 374 individuals. This community was selected because of a high incidence of infection in the preliminary survey. It was an isolated community having a pioneer type of social organization. It had no privy sanitation. The report brought out three important points concerning the epidemiology of amoebiasis. The youngest children infected were two years old. Thus, infection began in early life and maintained a high level throughout adult life either by persistence or reinfection, but dropped off after the age of sixty. About one-fourth of the population had had attacks of dysentery in the past ten years. The third point was that poorly nourished families showed no higher incidence of infection than the well nourished, nor was apparent uncleanliness of individuals or houses associated with a higher infection rate.

In the summer of 1947 Anderson and associates made a survey of patients and hospital personnel of the John Gaston Hospital in Memphis. There were 246 people who were examined three or more times; out of that group, forty-two (17 per cent) were found to be infected. Slightly more than half of the infected persons were harboring the trophozoite stage of the organism, indicating a larger number of active cases than was suspected. The probable reason for the higher percentage of infected individuals in this survey was improved laboratory techniques. Anderson and his group used fresh stools and made iron hematoxylin stains of all stools. In this way, they were able to detect trophozoites as well as cysts. These authors are of the opinion that since pathologic changes do occur in the tissues of infected people, that being infected would be "reason enough for adequate therapy and follow up of treated cases." They point out that conditions such as pregnancy or acute infections often initiate dysentery in the chronically infected or in the carrier. They believe that a carrier is a potential danger to himself and also to his associates.

The Division of Preventive Medicine of the University of Tennessee Medical School has set up a pilot diagnostic laboratory in order to compare some of the methods used in diagnostic work. This is a cooperative project with the Out-Patient Department of the John Gaston Hospital, and we hope to expand this work into a research program which will include a study of some of the other phases of amoebiasis. So far, the rate of infection of the specimens examined in this laboratory have compared very favorably with the results of previous surveys.

SUMMARY

The evidence accumulated to the present time indicates that there is an amoebiasis problem in the state of Tennessee. In view of the high rate of infection, I believe that certain steps should be taken to eliminate as many carriers as possible, especially those in the food handler group. Since diagnostic facilities are not adequate at present to examine all of the food handlers in an effort to find carriers and free them of infection, we will probably have to depend on public health groups and other agencies interested in health to educate the general public concerning possible modes of infection and methods of avoiding amoebiasis. Education of food handlers plus rigid rules of personal hygiene may do a great deal in reducing the infection rate in Tennessee. In the long run good preventive measures are often better than therapeutic ones.

REFERENCES

(1) Frye, W. W., and Meleney, H. E.: Investigations of *Endamoeba histolytica* and other intestinal protozoa in Tennessee. 4. A study of flies, rats, mice and some domestic animals as possible carriers of the intestinal protozoa of man in a rural community. Am. J. Hyg. 16: 729, 1932.

(2) Craig, C. F.: Observations upon the methods of transmission of amebiasis. Am. J. Pub. Health 25: 1231, 1935.

(3) Spector, B. K., and Bulky, F.: Viability of *Endamoeba histolytica* and *Endamoeba coli*. Pub. Health Rep. 49: 379, 1934.

(4) Spector, B. K., Foster, J. W., and Glover, N. G.: *Endamoeba histolytica* in washings from the hands and fingernails of infected persons. Pub. Health Rep. 50: 163, 1935.

(5) Sapero, J. J., and Johnson, C. M.: An evaluation of the role of the food handler in the transmission of amebiasis. Am. J. Trop. Med. 19: 255, 1939.

(6) Schoenleber, A. W.: The food handler as a transmitter of amebiasis. Am. J. Trop. Med. 20: 99, 1940.

(7) Meleney, H. E.: Community surveys for *Endamoeba histolytica* and other intestinal protozoa in Tennessee: first report. J. Parasitol. 16: 146, 1930.

(8) Meleney, H. E., Bishop, E. L., and Leathers, W. S.: Investigations of *Endamoeba histolytica* and other intestinal protozoa in Tennessee. 3. A state-wide survey of the intestinal protozoa of man. Am. J. Hyg. 16: 523, 1932.

(9) Milam, D. F., and Meleney, H. E.: Investigations of *Endamoeba histolytica* and other intestinal protozoa in Tennessee. 2. An epidemiological study of amoebiasis in a rural community. Am. J. Hyg. 14: 325, 1931.

(10) Anderson, H. H., Johnstone, H. G., Packer, H., Young, J. D., Callison, M. K., Hambly, A. S., Jr., Anderson, J. van D., and Reed, R. K.: Incidence and control of amebiasis and other intestinal protozoan infections in a Memphis hospital. Am. J. Trop. Med. 28: 373, 1948.

Nutritive Value of Cooked, Immature and Mature Cowpeas[1]

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ALTHOUGH cowpeas[3] are considered a staple part of the diet in many sections of the country, only a few studies have been made of the nutritive value of raw cowpeas, and no studies were found which reported losses of nutrients during cooking.

The vitamin A value of raw, immature cowpeas has been found to range from 233 to 385 I. U. per 100 gm. of fresh peas (1). The mature cowpeas were found to be much lower in vitamin A activity—34.7 to 69.5 I. U. per 100 gm. of peas. Another study (2) reported no vitamin A activity in mature cowpeas.

Ascorbic acid has been found to be high in the immature, raw cowpeas. Booher *et al.* (3) gave a value of 25 mg. per 100 gm. and French and Abbott (4) found a much higher amount—48.8 mg. per 100 gm. Ascorbic acid has not been found to be present in the mature cowpeas.

Thiamine has been reported to be high in cowpeas, its content ranging from 690 to 1110 mcg. per 100 gm. of different varieties of raw, mature cowpeas (2, 5).

Riboflavin analyses of raw, air-dried cowpeas (moisture content of 6.5 per cent), made by Peterson *et al.* (6), indicated fairly low values, the average in twelve varieties being 1.60 mcg. per gram.

Thus, from the analyses which have been made of raw cowpeas, it is apparent that this vegetable is an excellent source of thiamine and, if consumed at the immature stage of growth, is a fair source of vitamin A and a good source of ascorbic acid.

Inasmuch as sufficient data have been reported in the literature to show the nutritive worth of the cowpea, and because this vegetable is consumed in such large quantities in many parts of the country, the present experiment was undertaken to study the effect of common methods of cooking on the loss of nutrients from immature and mature cowpeas.

EXPERIMENTAL PROCEDURE

Two varieties of cowpeas were studied. The Cream Crowder variety, grown by the Department of Horticulture, was harvested and studied when immature (hulls green with a yellow tinge), and again when mature (after complete drying on the vines). A strain of the Blackeye variety was purchased from the market and studied at the mature stage only.

A raw sample of the immature Cream Crowder variety was analyzed for calcium, phosphorus, ascorbic acid, thiamine, and riboflavin. A 450-gm. portion was boiled (Method A, Table 1) until tender in a fat meat-water broth which had previously been boiled 2 hr. The cooked peas were drained and analyzed for the above mentioned nutrients. The cooking water was analyzed for ascorbic acid, thiamine, and riboflavin.

The raw, mature Cream Crowder cowpeas were analyzed for calcium, phosphorus, thiamine, and riboflavin. Two 120-gm. lots were soaked overnight. One lot was boiled until tender in a fat meat-water broth (Method B, Table 1). The other was boiled in water until tender, mashed, and the residual cooking water and mashed peas were poured into a skillet containing drippings and then cooked to a pasty consistency (Method C, Table 1).[4] The cooked peas were analyzed for calcium, phosphorus, thiamine, and riboflavin, and the cooking water from Method B for thiamine and riboflavin.

The mature Blackeye cowpeas were analyzed raw and after cooking by Methods B and C. The raw and cooked samples were analyzed only for thiamine and riboflavin.

The amounts used in the cooking methods are given in Table 1. Nine replications were made, and the data were studied by the analysis of variance.[5]

Calcium and phosphorus were determined by the Official Methods of the Association of Official Agricultural Chemists (7).

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[2] Present address, Mary Washington College of the University of Virginia, Fredericksburg.

[3] Commonly called "blackeyed" peas in the South.

[4] When cowpeas are cooked by this method in the home, they are usually served with a rich tomato sauce.

[5] All statistical work was done under the supervision of Dr. Boyd Harshbarger, Statistician, Virginia Agricultural Experiment Station.

TABLE 1

Description of cooking methods used

COOKING METHOD	WEIGHT OF RAW COWPEAS	VOLUME OF WATER	SALT	AMOUNT OF FAT MEAT OR DRIPPINGS USED	AVERAGE COOKING TIME	AVERAGE WEIGHT OF COOKED PEAS
	gm.	*ml.*	*gm.*	*gm.*	*min.*	*gm.*
A—Immature, boiled	450	400	4	70	22	420.4
B—Mature, boiled	120	400	4	60	45	303.9
C—Mature, mashed	120	300	4	40	45*	379.1

* Boiling time only. The time required to fry the mashed peas to the desired consistency varied from 10 to 15 min.

TABLE 2

*Effect of method of cooking cowpeas on their mineral and vitamin contents**

CONDITION OF SAMPLE	CREAM CROWDER VARIETY**					BLACKEYE VARIETY**	
	Calcium	Phosphorus	Ascorbic acid	Thiamine	Riboflavin	Thiamin	Riboflavin
	mg./lot	*mg./lot*	*mg./lot*	*mg./lot*	*mg./lot*	*mg./lot*	*mg./lot*
Immature:							
Raw	76.5	708.7	150.2	2.112	0.363		
Boiled	69.0	665.3	86.9	1.452	0.315		
L.S.D.†	††	††	5.4	0.168	0.008		
Mature:							
Raw	57.0	537.8		1.408	0.186	1.132	0.161
Boiled	80.1	538.9		0.831	0.144	0.757	0.111
Mashed	73.8	568.9		1.050	0.191	0.807	0.147
L.S.D.†	11.3	14.0		0.050	0.011	0.098	0.015

* Expressed on total lot basis of 450 gm. of fresh and 120 gm. of dried cowpeas.

** Figures given are means from nine replications.

† Least significant difference at the 5 per cent level.

†† Not significant.

Ascorbic acid was determined in the fresh cowpeas by the Morell (8) method. It was necessary to make the 3 per cent HPO_3 extracting medium in a 0.1 per cent solution of NaCN (9). The cyanide was effective in the destruction of oxidases which have been reported to be high in cowpeas (10).

Thiamine and riboflavin were determined on the same sample by modifications of the Conner and Straub and Peterson methods as described by Eheart *et al.* (9).

RESULTS AND DISSCUSSION

The immature Cream Crowder cowpeas did not lose a significant amount of calcium or phosphorus when boiled (Table 2[6]). The losses of vitamins, however, were significant. The loss of ascorbic acid was large, from 150.2 mg. per lot in the raw cowpeas to 86.9 mg. in those which had been boiled. The average thiamine content of the raw lots was 2.112 mg. per lot, whereas after boiling only 1.452 mg. were retained. Although significant, the riboflavin loss was much less than the other two vitamins since the raw fresh cowpeas contained 0.363 mg. per lot and the cooked peas 0.315 mg.

[6] All data are means of nine replications and are reported on the total-lot basis, since previous work has shown this to be the most accurate method (11).

The calcium content of mature Cream Crowder cowpeas was increased significantly by both methods of cooking, inasmuch as the raw peas contained 57.0 mg. per lot of calcium while those which were boiled contained 80.1 mg. and those which were mashed, 73.8 mg. The absorption of calcium from the water in which vegetables are cooked has been reported previously (12) from this laboratory, where the water is high in calcium, containing 45 p.p.m. (parts per million). Phosphorus was not lost from the mature cowpeas by either method of cooking inasmuch as the raw, mature peas contained 537.8 mg. per lot, the boiled peas 538.9 mg., and the mashed peas 568.9 mg. The cause of the significant increase in the latter case is at present unknown.

Thiamine and riboflavin losses were significant for all boiled, mature cowpeas. The raw, Cream Crowder cowpeas contained 1.408 mg. of thiamine per lot and 0.186 mg. of riboflavin, whereas after boiling they had only 0.831 mg. of thiamine and 0.144 mg. of riboflavin. The amounts of thiamine and riboflavin in the Blackeye variety were similar but slightly lower in all cases. This does not indicate a significant varietal difference since the source of supply for the two varieties was different. The Cream Crowder cowpeas which were mashed retained significantly more thiamine and riboflavin than the

TABLE 3

Percentage retention of vitamins in cowpeas cooked by three methods

COOKING METHOD	ASCORBIC ACID			THIAMINE			RIBOFLAVIN		
	Retention in peas*	Retention in cooking water*	Oxidized**	Retention in peas*	Retention in cooking water*	Destroyed**	Retention in peas*	Retention in cooking water*	Destroyed**
	%	%	%	%	%	%	%	%	%
Cream Crowder variety									
Immature, boiled	57.9	35.2	6.9	68.9	22.8	8.3	86.7	29.8	+16.5
Mature, boiled				58.6	17.5	23.9	77.6	5.0	17.4
Mature, mashed				74.4		25.6	102.2		+2.2
Blackeye variety									
Mature, boiled				67.2	23.7	9.1	69.2	27.2	3.6
Mature, mashed				71.3		28.7	91.5		8.5

* Figures are means from nine replications.

** Calculated by difference.

boiled lots, 1.050 mg. of thiamine and 0.191 mg. of riboflavin. The cowpeas cooked by this method lost thiamine when compared with the raw peas but did not lose any riboflavin. Similar findings were noted for the mashed Blackeye cowpeas except that the thiamine content was much lower and not significantly higher than that of the boiled peas. From these results it would appear that the method described here as "mashing" was superior to boiling the cowpeas, inasmuch as the former method caused no significant loss of riboflavin and a smaller loss of thiamine. The addition of the water to the mashed peas was probably the reason for the above result, since there were no losses of the vitamins due to solution.

The percentages of ascorbic acid, thiamine, and riboflavin lost by solution and destruction are given in Table 3. In the immature Cream Crowder cowpeas only 6.9 per cent of the ascorbic acid was destroyed, but 35.2 per cent was dissolved into the cooking water. Again in the case of thiamine, only 8.3 per cent was destroyed and 22.8 per cent was found in the cooking water. An interesting result was noted in the case of riboflavin. The amount in the cooked peas, 86.7 per cent, plus that in the cooking water, 29.8 per cent, was 16.5 per cent more than was found in the raw cowpeas. A similar result was found in navy beans by Hewston *et al.* (13) who noted higher riboflavin values in the cooked beans than in the raw ones. These researchers found that the value of the raw beans was low, due to incomplete extraction, and suggested that riboflavin may have been bound to a protein fraction and was not released by the usual treatment with acid and enzymes. This may have been the case with cowpeas, or it is possible that the cause of the discrepancy was not too low an amount in the raw cowpeas but the high value found for the riboflavin content of the cooking water. The presence of a fluorescent substance in the cooking water which (in addition to riboflavin) was destroyed by sodium hydrosulphite would give such results.

In general, more riboflavin than thiamine was retained in the cooked, mature peas, from 58.6 to 74.4 per cent of the thiamine and 69.2 to 102.2 per cent of the riboflavin.

The nutritive value of immature and mature Cream Crowder cowpeas was compared on the 100-gm., dry basis (Table 4). In all cases, the immature samples were higher in nutritive value than the mature ones. The nutritive value of 100-gm. servings of both varieties of cowpeas when cooked was calculated (Table 4). A 100-gm. serving of the boiled, immature Cream Crowder cowpeas gave 20.7 mg. of ascorbic acid, 0.345 mg. of thiamine, and 0.075 mg. of riboflavin. After maturing, the cooked cowpeas contained no ascorbic acid and somewhat lower amounts of thiamine and riboflavin than the immature, boiled cowpeas. The use of immature cowpeas should be encouraged, since they are such excellent sources of ascorbic acid and thiamine. The difficulty of shelling the immature peas in the home is obvious, and a mechanical device for shelling them might well be developed. Since the method in which the peas were mashed caused a higher retention of nutrients than boiling the mature cowpeas, it would seem best to recommend that the immature peas also be cooked by this method in preference to boiling.

SUMMARY AND CONCLUSIONS

When immature and mature Cream Crowder and mature Blackeye cowpeas were cooked by several methods, it was found that calcium and phosphorus losses were in no case significant.

The loss of ascorbic acid from immature Cream Crowder cowpeas was high, only 57.9 per cent being retained. Most of the loss, 35.2 per cent, was due to solution in the cooking water.

The thiamine loss was lower inasmuch as, with one exception, at least two-thirds of this vitamin was retained in the cooked cowpeas. Riboflavin was retained best since 69.2 to 102.2 per cent of this vitamin remained in the vegetable after the various methods of cooking.

TABLE 4

Comparative nutritive value of raw, immature, and mature cowpeas

COOKING METHOD	CALCIUM*	PHOSPHORUS*	ASCORBIC ACID*	THIAMINE*	RIBOFLAVIN*
	mg./100 gm.	*mg./100 gm.*	*mg./100 gm.*	*mg./100 m.g*	*mg./100 gm.*
Cream Crowder variety					
Raw					
Immature	63.5**	588.2†	124.6**	1.753**	0.301**
Mature	54.7**	516.3†		1.352**	0.179**
Cooked					
Immature, boiled	16.4	158.3	20.7	0.345	0.075
Mature, boiled	26.4	177.3		0.274	0.047
Mature, mashed	19.4	150.5		0.278	0.050
Blackeye variety					
Mature, boiled				0.270	0.039
Mature, mashed				0.039	0.042

* Reported on dry weight basis.

** Figures given are means from nine replications.

The best method of cooking cowpeas for retention of nutrients was found to be as follows: boil until tender in sufficient water to cover; mash; pour the mashed peas and remaining cooking water into a skillet containing bacon fryings; and cook until thick. By this method all of the riboflavin and about three-fourths of the thiamine were retained. If used for immature cowpeas, the retention of ascorbic acid should be high, since 35.2 per cent of this vitamin was found in the cooking water when the immature peas were boiled.

The nutritive value of cowpeas is excellent. They are good sources of phosphorus and thiamine, and the immature cowpeas are a good source of ascorbic acid. The development of a mechanical sheller for the difficult task of shelling immature cowpeas in the home might promote wider use of this food in the immature state.

REFERENCES

(1) Sherman, W. C., and Salmon, W. D.: Carotene content of different varieties of green and mature soybeans and cowpeas. Food Research 4: 371, 1939.

(2) Halverson, J. O., and Sherwood, F. W.: The vitamin A activity and the vitamin B_1 content of soybeans and cowpeas. J. Agric. Research 60: 141, 1940.

(3) Booher, L. E., Hartzler, E. R., and Hewston, E. M.: Vitamin Values of Foods. Brooklyn: Chemical Publishing Co., 1942.

(4) French, R. B., and Abbott, O. D.: Vitamin C in Florida fruits and vegetables. Florida Agric. Exper. Sta. Ann. Rep. No. 66, 1943.

(5) Booher, L. E., and Hartzler, E. R.: The vitamin B_1 content of foods in terms of crystalline thiamin. USDA Tech. Bull. No. 707, 1939.

(6) Peterson, W. J., Halverson, J. O., Sherwood, F. W., and Baxley, H.: The riboflavin content of cowpeas, soybeans, and peanuts. North Carolina Agric. Exper. Sta. Progress Note No. 6, 1944.

(7) Official and Tentative Methods of Analysis. 5th ed. Washington: Assn. of Official Agricultural Chemists, 1940.

(8) Morell, S. A.: Rapid photometric determination of ascorbic acid in plant materials. Indust. & Engin. Chem. Anal. Ed. 13: 793, 1941.

(9) Eheart, J. F., *et. al.*: Vitamin studies on Lima beans. Southern Cooperative Series Bull. No. 5, 1946.

(10) Reid, M. E.: Protection of ascorbic acid during its extraction from plant tissues. Food Research 7: 288, 1942.

(11) Eheart, M. S., and Sholes, M. L.: Effect of old-fashioned and modern methods of cooking on the retention of nutrients in vegetables. 1. Cabbage. Influence of method of reporting data on results. Food Research 13: 106, 1948.

(12) Eheart, M. S., and Sholes, M. L.: Effects of method of blanching and temperature of storage on nutritive value of dehydrated cabbage. Food Research 11: 298, 1946.

(13) Hewston, E. M., Greenwood, J. B., and Orent-Keiles, E.: Extraction of riboflavin from navy beans. Bureau of Human Nutrition and Home Economics Notes No. 2, 1946.

Suggestions for Vocational Guidance Activities

One of the principal activities of the Vocational Guidance Committee of the American Dietetic Association is to make known to students the lasting value and fascinating careers which are open in the field of dietetics. One of the avenues open for promoting such work is through vocational guidance associations. Every large city has such an organization, and the smaller towns and rural areas have similar groups in the high schools. Now is the time to make contacts with these associations, for, with the beginning of the school year, programs are being planned and suggestions are welcomed.

The field open to dietitians in the schools represents an opportunity which has barely been touched by dietitians in their vocational guidance work. In arranging local programs, plan to include a visit to every school in the community. This is an ambitious program; however, it can be done if plans are properly organized and all available community facilities are used. —*Eva N. Ylvisaker, Co-Chairman, A.D.A. Vocational Guidance Committee.*

Editorial

REORGANIZATION AND CONSTITUTION

Look at the Big Things

Holding up the vote on the Constitution until after the meeting in Boston, to allow for a discussion at the House of Delegates seemed like an excellent suggestion. The Association lawyer was consulted to see if that procedure would be legal. He informed us that if we did wait for this discussion, the votes could not be counted until October, 1949.

The committee[1] realizes that many of the changes incorporated in the new Constitution are needed immediately, such as the legalizing of the Council of the House of Delegates and the transferring of a considerable part of the Association activities to the House. It was, therefore, decided to proceed according to the original plan and submit the Constitution to the membership for voting this year.

Let us explain our reasoning. The committee has made every effort to meet all the objections that have been raised against the present organization. It has incorporated in the proposed Constitution an organization which is designed to meet the needs of the Association as it sees them, after careful study of the entire situation. All of your suggestions have been considered seriously, many of them adopted, and in some cases a compromise was made to meet two conflicting opinions. Undoubtedly there are some points in the proposed Constitution with which you will not be entirely in accord. In voting, won't you consider the bigger issues with the idea that minor points can be ironed out later?

We plan to ask the Council of the House of Delegates to place on the agenda of their meeting reports of both the Reorganization Committee and the Constitution Committee, and to allow time for discussion. In case any part of the new Constitution needs to be changed, the recommendations from the House of Delegates will be passed on to the Constitution Committee to be considered for revisions next year. This will make it possible to iron out any differences of opinion without having to wait a year to get the essential changes into operation.

It is hoped that you will consider this when voting. The committee also hopes that you will approve of their efforts to satisfy the majority of the members.

In the August JOURNAL, some of the major changes in organization and the new Constitution were discussed. Here, the Committee would like to explain additional proposed changes.

THE OBJECT OF THE ASSOCIATION

The original object of the Association has been augmented. It was thought that raising the standard of dietary work (now called dietary service) expressed only improvement from within. As one of the functions of the Association is to increase the prestige of the profession, the Committee has added the phrase, "raising the status of the profession," to the object.

MEMBERSHIP REQUIREMENTS

The requirements for active membership have been reworded, because some of the colleges do not include in their "major in foods and nutrition" all of the basic training that the Association is now requiring. It has, therefore, been simplified to read, "a bachelor's degree from an accredited college or university, including or followed by the basic academic work. . . ."

Associate membership is being dropped for the future. There will be no change in the status of the present associate members.

Life memberships are to be changed, but the plan is still under consideration. Explanation will appear next month.

DUES

Dr. Helen A. Hunscher, our President, has made clear in her recent letter to the members the ever-increasing expansion of the Association which, together with higher costs of everything, has made the balancing of the budget very difficult both for the national Association and for the state associations.

With this in mind, the Committee has recom-

[1] For personnel of the committee see page 502, June issue of this JOURNAL.

mended in the proposed Constitution that the annual dues be increased to twelve dollars ($12.00). Of this amount three dollars ($3.00) will be refunded to the state associations, thus helping them to meet their increased cost of operation.

ELECTIONS

A change in the method of election is contemplated, but the Committee is still working on this. It will be explained in the October JOURNAL.

FINANCE COMMITTEE

The change in the personnel of this committee is very important. It will be made up of the Treasurer, the President, the President-Elect, and the two senior Delegates-at-Large, representing the Council of the House of Delegates. This change has been made with the idea that the last two named will have had two years' experience in the House of Delegates and they, being members of the Council, can contribute more to this committee because they will have a better understanding of the wishes of the House of Delegates.

DIETETIC INTERNSHIP BOARD

A new board has been established, consisting of six members, one to be appointed each year for a term of six years. The senior member will serve as chairman and the second in seniority will serve as secretary. This organization will give greater continuity to the dietetic internship approval activity, because the chairman will have served five years, one of these years as secretary, before she assumes the chairmanship of this important board. The Dietetic Internship Board will make recommendations to the Executive Board concerning policies and can appoint committees to assist in the details of its work.

DELEGATES-AT-LARGE

In the present organization, the Delegates-at-Large represent the states that have no state associations. There are only three such states, and their combined membership is so small that it provides for only one delegate.

The Committee believes that six well-selected delegates, elected for a term of three years by the entire membership, would give considerable continuity and therefore stability to the House of Delegates. Therefore, a provision has been included in the Constitution for six Delegates-at-Large, two to be elected each year from a term of three years. The two senior Delegates-at-Large will serve on the Council of the House of Delegates and represent the House on the Finance Committee.

VICE-PRESIDENT-ELECT

With the Vice-President having such an active responsibility as Chairman of the House of Delegates and the Council, it has seemed advisable that she have a year of preparation for this activity. The provision has been made to elect her one year ahead —that is, to elect a Vice-President-Elect. As such, she will be an ex-officio member of the Council without vote, and automatically take the office of Vice-President at the second annual meeting after her election. She will be in a position to take over the duties of Chairman of the House of Delegates and the Council if any circumstance arises which makes it impossible for the Vice-President to serve.

SECTIONS

The Section Chairmen, with the officers, will make up the new Board of Directors, whose responsibility will be to plan the program of work for the Association.

Some of the projects undoubtedly will be conducted with membership participation, under the Chairmen of the sections. Many of the projects, however, will be referred to corresponding sections in the House of Delegates for carrying on the work through the states and reporting to the House. This part of the program of work will be under the direction of Assistant Section Chairmen appointed by the Chairman of the House of Delegates and approved by the Council. As this section organization develops in the House, more and more of the section activities will undoubtedly be transferred to it. It is thought that this will promote state participation in the projects.

STANDING COMMITTEES

The standing committees have been divided into two groups, those which are concerned with the general Association activities and those which are concerned with state activities or with the functioning of the House of Delegates.

Those in the first group are either elected by the membership or appointed by the President subject to the approval of the Executive Board. They carry the responsibilities directly related to the membership or to the administration of the Association. These committees are: Nominating, Finance, Membership, Constitution, History, Awards, Loan Fund, Credentials, Professional Ethics and Status, Foreign Scholarship, Public Relations, History of Nutrition, and Legislative Policy.

The second group of committees has been transferred to the activities of the House of Delegates. They will be elected by the House or appointed by its Chairman with the approval of the Council. These committees will be responsible to the House, and the Council will guide their activities. These standing committees of the House include: Committee on Committees, State Association Officers, Organization of State Associations, Handbook, By-Laws, Credentials, Nominating (House), Resolu-

tions, Convention City, Legislative Information, and Public Relations Information.

The last two committees will work closely with the corresponding committees in the first group by keeping the state associations informed on the activities of these committees.

Although the October JOURNAL will be out just about the time you are studying the proposed Constitution, watch for the important discussion on election, life membership, and several other points that you will want to consider carefully.

In order to supplement this discussion of changes in the organization of A.D.A., a chart showing the proposed plan has been made. This chart will be found on page 776 of this issue.—*Anna Boller Beach, Chairman, Constitution Committee.*

ON TO BOSTON

Boston, the target of hundreds of dietitians and nutritionists for the past year, will become a reality October 18–22! Well-planned programs will provide scientific stimulation, practical information, friendly contacts, and colorful trips. Cordiality, hospitality gastronomic pleasures, and entertainment are anticipated.

Arrangements for making hotel reservations are noted on page 316 in the April issue of the JOURNAL; a map appears on page 681 in the August issue; descriptions of trips and clinic visits appear in the June, July, and August issues on pages 515, 602, and 679 respectively; and the tentative program is outlined on pages 790 through 794 in this issue.

Major interest will center around the meetings devoted to public relations and vocational guidance. Opportunities will be offered to attend an informal session on public relations Tuesday morning, October 19, and a general session on that topic in the evening. The vocational guidance discussion meeting will be preceded by a breakfast.

Of exceptional interest will be the report of the newly Revised Recommended Dietary Allowances of the Food and Nutrition Board of the National Research Council. Dr. P. C. Jeans, a member of the Board, will discuss the scientific basis for the changes which have been made in calories, minerals, and vitamins. The practical considerations involved in meeting these Allowances will be discussed by Dr. L. A. Maynard. At this same meeting, Dr. Charles G. King will point up other new advances in nutrition.

Eminent specialists and authorities from Boston will present stimulating topics of interest to the therapeutic dietitian. Dr. E. P. Joslin will describe some of the high spots in the historical development of the treatment of diabetes; Dr. Alexander Marble will present the new advances in the treatment of diabetes; Dr. Priscilla White will take the controversial topic of controlled versus free diet in diabetes; and Dr. Frank N. Allan will report on the new *Handbook of Diabetes.*

Other topics of interest to the therapeutic dietitian will be presented by such authorities as Dr. George W. Thorn, who will speak on renal vascular diseases; Dr. Frederick J. Stare, whose subject will be fat metabolism; Dr. David Aymon, who will discuss diet and hypertension; and Dr. Robert T. Monroe, whose paper will deal with practical problems connected with feeding the aged.

Child and maternal health will receive outstanding attention from such speakers as Dr. Harold Stuart, an authority on growth and development; Dr. Clement Smith, who will report on recent observations on the effect of maternal nutrition upon pregnancy and the new-born; Dr. Nevin Scrimshaw who will explain how to evaluate signs and symptoms of nutritional deficiency in the pregnant woman; and Dr. Stuart Stevenson who will compare breast and artificial feeding. In view of the increased responsibilities of the dietitian for child feeding practices in the hospital, another special session will be devoted to this topic.

Other new areas of major responsibility for the dietitian and nutritionist have developed in health education, a field for which advanced training, specialized knowledge, and critical research are needed. In practicing adult health education, the dietitian already has learned that it is not enough to "give information" or issue printed diet lists; she must also assume some of the responsibility for influencing behavior through "changing food habits." As Dr. Donald Armstrong, in the Foreword to the new book, *Motivation in Health Education*, points out: "Knowledge generally outdistances behavior, and most humans do not 'live up' to their understanding." Changing food habits requires a keen appreciation of human behavior and familiarity with special procedures in the education of the patient. In this area, one of the first important considerations is that of the motivation of human beings. The various aspects of this major problem will be discussed by Dr. Margaret Mead, Dr. Alexander Bavelas, Dr. Mary Spencer, and Ethel Walsh.

Subjects of special interest to the administrative dietitian are layouts and management. For the first time an architect will appear on the program to discuss some of the mutual problems which require joint planning with the dietitian. William A. Riley, a member of the American Institute of Architects; M. W. Wall, Manager of the New England Branch, S. Blickman, Inc.; and Clarice Gullickson of the Dietetic Division of Veterans Administration will deal with these subjects.

Another discussion of interest to the administrative dietitian will concern personnel relations; this subject will be covered by Dr. F. A. Magoun, Professor of Humanics at Massachusetts Institute of Technology. The topic of quality food service also will be discussed

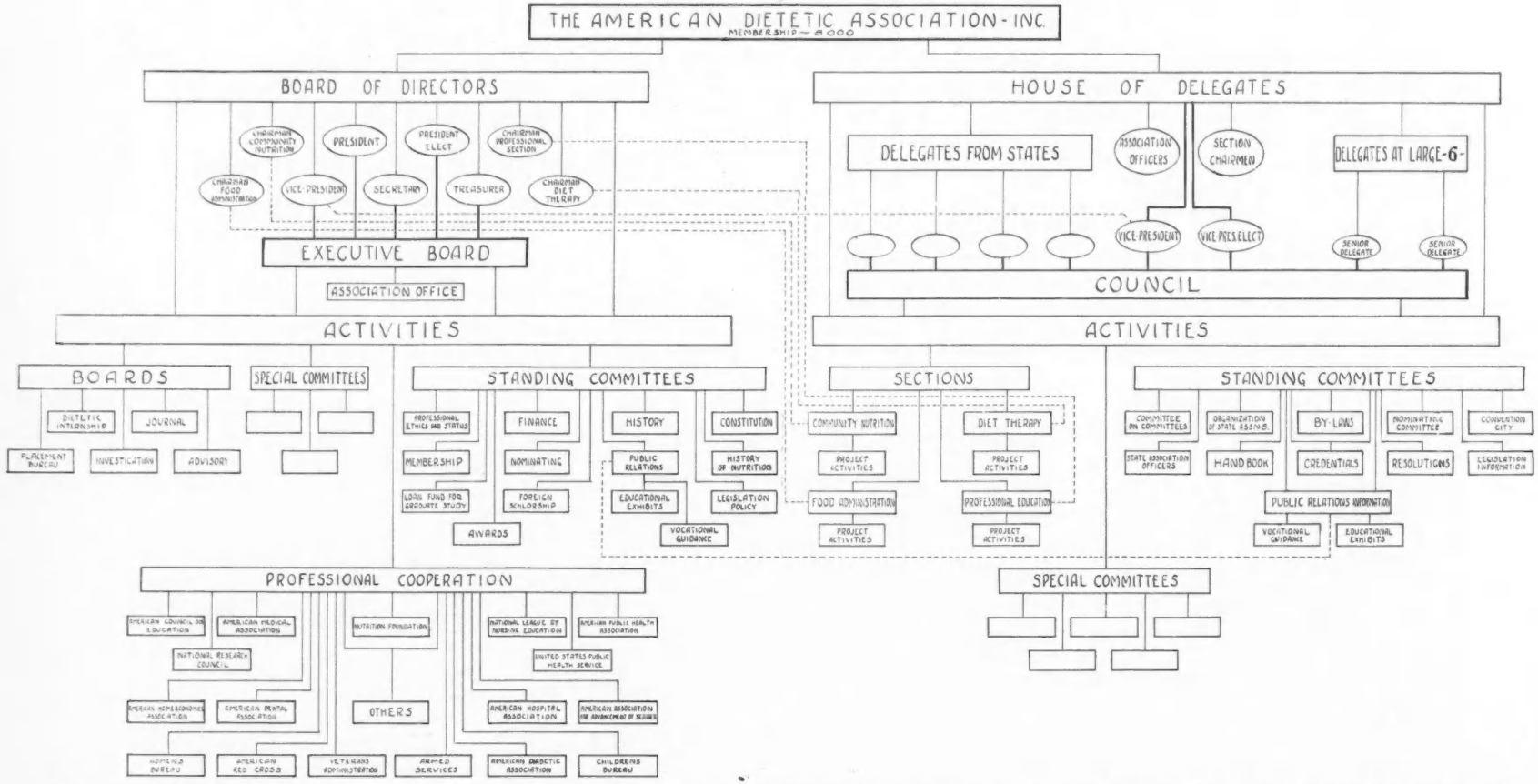

Chart showing organization of the American Dietetic Association as provided in the proposed revision of the Constitution. Errata: There should be a line connecting "Activities" and "Standing Committees" under the section dealing with the House of Delegates.

by such experts in the field as Hazel M. Fullriede from Cincinnati and Mary Riste, Grand Rapids, Michigan.

The business of the Association will be transacted at the meeting of the House of Delegates on Monday, October 18, at the Hotel Statler. Sessions will be based on reports of officers, section chairmen, special committees, and on known and requested business items.

Reunion breakfasts, a meeting for state officers, a press relations luncheon, and the exhibitors' luncheon will provide entertainment and an opportunity for meeting new and old friends.

Margaret McGovern, Chairman of the Convention Trips Committee, announces that, in their respective states, the following people are responsible for the arrangement of tours in the various New England states the week-end before and the week-end after the convention: *Connecticut*—Alice Ryan, Aetna Life Insurance Company, Hartford; *Maine*—Myrtle E. Kenney, Director of Nutrition, American Red Cross, 97 State Street, Portland 3; *New Hampshire*—Alice Van Dyke, St. Paul's School, Concord; *Rhode Island*—Marjorie Underwood, Chief Dietitian, Roger Williams General Hospital, Providence; *Vermont*—Jean Bates Welch, 50 Central Street, Northfield. Members interested in visiting industrial lunchrooms and cafeterias, school cafeterias, college commons, hospitals and clinics, nutrition laboratories, testing and demonstration kitchens and laboratories, college foods and nutrition departments, department store restaurants, and so on in one or more of the states mentioned above should contact the chairman for detailed information so that plans may be made accordingly.

NEW STAFF APPOINTMENT FOR ASSOCIATION OFFICE

Beginning late in August, Mary Ellen Johnson became a member of the headquarters staff of the American Dietetic Association, where she will fill the position of Assistant to the Educational Director. Miss Johnson is a graduate of Iowa State College, Ames, and took her dietetic internship at King County Hospital, Seattle. Following the completion of her internship, she was employed as a member of the dietary staff at King County Hospital for a year. From there, she went to Saint Luke's Hospital, Denver, where she has remained for the past five years. At Saint Luke's, she has served both as therapeutic dietitian and administrative dietitian.

Miss Johnson has also been active in the affairs of the Colorado Dietetic Association, having held the offices of President and Secretary, and she is currently serving as Treasurer. In addition, she has been President, Secretary, and Treasurer for the Denver Dietetic Association.

Her well-rounded professional experience will undoubtedly be of much value to her in her new position, for it will entail much work concerning membership in the Association, as well as other duties of an administrative nature.

AN INTRODUCTORY READING LIST ON HISTORY OF NUTRITION

As a hobby—for entertainment and cultural relaxation or for better appreciation of the present through knowledge of the past—reading in the field of history of nutrition and dietetics offers rich rewards.

This historical field offers many specific areas for study: biographical studies of early nutrition workers; origin of words and terms used; history of therapeutic diets; discovery of nutrients; food customs of native tribes, early pioneers, and other groups; dates of discoveries in nutrition; and related fields.

To the beginner who wishes to taste of the intellectual delights hidden in these pages of history, the books listed below will serve as appetizers. They offer brief insights into the lives of the earlier workers and glimpses of some of the early theories on diet that in some cases today are being "rediscovered" and offered as new ideas. Once sampled, these books make the reader to want to explore on her own. The articles appearing in this JOURNAL from time to time offer examples of some of the fruits of such individual explorations, and the bibliographies with these articles provide further source material for starting out in this field. Rich sources of historical material are to be found in diaries, old letters, early newspapers, pamphlets, and early hospital menus.

BOOKS

(1) LUSK, G.: Nutrition. Clio Medica Series. New York: Paul B. Hoeber, Inc., 1933.
(2) MCCOLLUM, E. V., ORENT-KEILES, E., AND DAY, P.: Newer Knowledge of Nutrition. 5th ed. New York: Macmillan Co., 1939, Chap. 1.
(3) ROSE, M. S.: Foundations of Nutrition, (Any edition). New York: Macmillan Co., Chap. 1.
(4) MOTTRAM, V. H., AND GRAHAM, G.: Hutcheson's Food and the Principles of Dietetics. Baltimore: Williams & Wilkins, 1941.
(5) SHERMAN, H. C., AND SMITH, S. L.: The Vitamins. 2nd ed. New York: Chemical Catalog Co., 1931.
(6) HESS, A. F.: Scurvy Past and Present. Philadelphia: J. B. Lippincott Co., 1920.
(7) PRENTICE, E. P.: Hunger and History. New York: Harper & Bros., 1939.
(8) DRUMMOND, J. C., AND WILBRAHM, A.: The Englishman's Food—A History of Five Centuries of English Diet. London: Jonathan Cape, Ltd., 1939.
(9) CUMMINGS, R. O.: The American and His Food. Chicago: University of Chicago Press, 1941.
(10) HARRIS, L. J.: Vitamins and Vitamin Deficiencies. Philadelphia: P. Blakiston's Son & Co., Inc., 1938.
(11) JACOB, D. E.: Six Thousand Years of Bread: Its Holy and Unholy History. Garden City, N. Y.: Doubleday, Doran & Co., 1944.
(12) HOOBLER, I. M., AND WILLIAMS, R.: Hidden Hunger. Lancaster, Pa.: Jacques Cattell Press, 1945, Chap. 1 and 2.
(13) BEVIS, A. M.: Diets and Riots. Francestown, N. H.: Marshall Jones Co., 1936.

PERIODICAL PUBLICATIONS

(1) RORER, S. T.: Early dietetics. J. Am. Dietet. A. 10: 289, 1934.
(2) MCCAY, C. M.: Seven centuries of scientific nutrition. J. Am. Dietet. A. 15: 648, 1939.
(3) FLYNN, M. A.: Dining with Samuel Pepys in seventeenth century England. J. Am. Dietet. A. 20: 434, 1944.
(4) LORENZ, A. J.: Army hospital diets—past and present. J. Am. Dietet. A. 20: 430, 1944.
(5) VAN SYCKLE, C.: Some pictures of food consumption in the United States. 1. 1630 to 1860. 2. 1860 to 1941. J. Am. Dietet. A. 21: 508, 690, 1945.
(6) MCCAY, C. M.: Four pioneers in the science of nutrition —Lind, Rumford, Chadwick, and Graham. J. Am. Dietet. A. 23: 397, 1947.
(7) HUDDLESON, M.: A new profession is born. J. Am. Dietet. A. 23: 573, 1947.
(8) GILSON, H. E.: Some historical notes on the development of diet therapy. J. Am. Dietet. A. 23: 761, 1947.

DICTIONARIES

(1) New English Dictionary on Historical Principles. Sir J. A. H. Murray, H. Bradley, W. A. Craigie, and C. T. Onions, editors. Oxford: Clarendon Press, 1933.

—Prepared by E. Neige Todhunter, Chairman, A. D. A. Committee on History of Nutrition and Dietetics.

Philadelphia Dietitians Promote Public Relations with Allied Groups

In an effort to maintain and build up good public relations with allied groups, the Philadelphia Dietetic Association this year offered assistance to the medical group. As a first step, a meeting of representatives from the Philadelphia Metabolic Association and members of the Diet Therapy Section was held. At this meeting, Dr. David Kramer, who is responsible for the Open Forums of the Metabolic Association held twice yearly, agreed to call on the dietetic group to plan and prepare the dietary exhibit for the next forum and requested that a dietitian be appointed to answer questions or perhaps to speak at this meeting.

Following this, the chairman of the Diabetic Committee of the County Medical Society suggested that the dietitians arrange a series of lectures for diabetic patients in Philadelphia and vicinity—a plan which the executive board of the Dietetic Association approved.

Six weeks before the lectures began, an announcement was carried in *Philadelphia Medicine*, the Philadelphia medical news weekly, and doctors sent their patients to register at the County Medical Society headquarters, with notes for special instructions and with the particular diet recommended. No registration fee was charged.

Four 1½-hr. lectures were held on Thursday evenings, May 27 to June 17. The first half hour of the class was devoted to general dietary instruction and the final hour to individual attention. For patients who did not need the general instruction, the class routine was dispensed with, and it was interesting to observe the regular lecture and the individual lessons in several rooms or cubicles being given simultaneously. In some instances, patients attended only the lecture portion of the sessions, as recommended by their doctors. The four lectures covered the following topics: (a) why a diabetic should maintain a diet, which is basically a normal diet modified to suit his needs; (b) carbohydrate; (c) proteins and fats; and (d) vitamins and minerals.

Patients who attended these meetings have been enthusiastic about the opportunity, and the general feeling is that this program has stimulated medical groups to an appreciation of the work dietitians are trained to do and to realize that assistance is available for patients when needed. Some of the doctors themselves have asked questions and are making use of suggestions which facilitate the calculation of prescriptions. Others have indicated an interest in classes to help patients with other disorders requiring different dietary regimens, and it has been suggested that visiting nurses attend the classes.

From twenty-five to thirty people attended each of the meetings, and many more are waiting for the program planned for the fall. Already more adequate forms are in preparation for use in obtaining dietary histories as well as forms for use in dietary instruction.

Current Comment

THE TEACHING OF NUTRITION IN SCHOOLS OF MEDICINE[1]

JAMES R. WILSON, M.D.

Secretary, Council on Foods and Nutrition, American Medical Association, Chicago

New information in the field of nutrition is being reported almost daily, and many dietitians have contributed to this knowledge. The appreciation and application of new information offers many problems—problems which concern your organization and mine. Our common goal is to narrow the gap between research and its application for the betterment of the individual and public health.

Dr. James S. McLester, the Chairman of our Council and the author of a book with which you are all familiar, *Nutrition and Diet in Health and Disease*, has said, "Science promises to those people who will use the newer knowledge of nutrition greater vigor, increased longevity, and a higher level of cultural attainment."

If these things are true—if it is true that the application of known knowledge now will help build a stronger America—then the teaching of nutrition is important. In medicine, nutrition is a vital subject, and its teaching in schools of medicine must be constantly reviewed. I would like to discuss this subject in order that we may consider some of the ways in which your group and the medical school faculties can work together to keep the gap between research and its application as narrow as possible; I would like to point out also some of the areas that require emphasis.

PURPOSE OF MEDICAL EDUCATION

Because we know how much humanity would profit by the application of *known* nutritional knowledge *now*, you and I may tend to be impatient with progress and wish that we could pour into every medical student everything that each of us knows. With this in mind, I would like to examine first the comments of Dr. H. G. Weiskotten on the subject of medical education in general and what its purpose is.

Dean Weiskotten, as you know, is an outstanding authority in the world today on the subject of medical education. He worked long and hard making and reporting the last American Medical Association survey of medical education in the United States and has acted in a consulting capacity for other nations. He succeeded Dr. Ray Lyman Wilbor as Chairman of the Council on Medical Education and Hospitals in 1947.

Dean Weiskotten has said that the prime object of the medical school is to give the student basic knowledge and an attitude on which it is possible for him to *build for himself* a well-rounded medical education. The medical school can offer only the groundwork. It does not completely educate a medical student; the best school gives him only a start on the road to acquiring a more complete education.

Does this sound unreasonable? Let each of us examine our own education for the moment. How many of us learned *all* that we know as students at our universities? When we are impatient, it is well for us to remember that the best student in the best school gets only a basis and a stimulus for further professional growth.

PLACE OF NUTRITION IN THE MEDICAL CURRICULUM

Thus we come to the question of the proper place of nutrition in the medical curriculum. As expressed by Dr. McLester, there is need to induce teachers of medicine to weave a heavier design of this relatively new subject into the already tight fabric of daily teaching.

Dr. Morris Fishbein, in an introduction to a recent series of editorials on the teaching of nutrition (1), indicated that nutrition has become fundamental in all of the teaching of medicine. He emphasized that nutrition is no longer considered a well defined course of instruction to be given in fixed periods in the medical curriculum and pointed out that the diseases resulting from deficiencies of specific substances in the diet can easily be covered in the course of internal medicine. Far more important, he stated, are the effects of dietary deficiencies on the constitution of the human being, on the blood, and on vital organs. Hence it becomes necessary to

[1] Presented at the 30th Annual Meeting of the American Dietetic Association in Philadelphia, on October 16, 1947.

teach nutrition in all of its aspects in every one of the clinical branches of medical instruction.

It is my hope that this discussion will call to your attention some of the points of contact where our two professions can cooperate to give the medical student the best possible groundwork on which to build his education. The student and some of the medical profession are not fully aware of *all* that dietitians can contribute and the many ways in which they can make their contribution both to the maintenance of health and in recovery after illness. Nor are some of the medical profession always aware of how dietitians can assist in the education of the medical student.

SURVEY OF METHODS OF TEACHING NUTRITION

The Council on Foods and Nutrition has been exploring some of the ways in which medical education can be made more effective by closer cooperation with your profession. In this connection I shall now report briefly on the current study that we are making of methods of teaching in medical schools.

The study is a pilot study that will cover a few schools only. The method involves personal visits by a committee consisting of Dr. John B. Youmans, C. A. Elvehjem, and myself. Those in charge of teaching are interviewed in both clinical and preclinical departments. A sampling of students, interns, and residents are interviewed. The content of courses both immediately and remotely concerned with nutrition are studied. In teaching hospitals and clinics, the role of the dietitian is studied. Ward records, medicine cabinets, and food trays are inspected. The record room, the pharmacy, and the library are visited. In brief, an attempt is made to study both the method of teaching and its effectiveness. This method is slow, but it is hoped that descriptions of the teaching methods will be useful both to the Council on Foods and Nutrition and to other interested groups and that constructive suggestions may evolve.

You will be interested to know that in one of the schools visited, it was found that certain aspects of nutrition were introduced to the student even in the first-year anatomy. In the same school, nutrition gets further emphasis in pathology, although not disproportionate emphasis in spite of the fact that the head of the department is widely known for his research work in the field of nutrition. Thus, it is not just in the courses of physiological chemistry and physiology that nutrition is studied in this and many other medical schools. It can be and perhaps should be emphasized in other pre-clinical departments as well.

The presence of an enthusiastic nutritionist is provocative and research in the field is a great stimulus to interest and teaching.

In the clinical years of the medical curriculum, nutrition must be studied and applied as it relates to the problems of the several clinical branches of medicine. It is here that the enthusiastic assistance of the dietitian will be increasingly needed and used.

In discussing the teaching of nutrition in the clinical years of medical education, I shall draw freely from opinions expressed in a series of editorials which recently appeared in the *Journal of the American Medical Association* (1) and which were prepared with the full cooperation of the Council on Foods and Nutrition.

NUTRITION IN PEDIATRIC EDUCATION

In pediatrics, the teaching of nutrition has always been important. Generally speaking, good pediatric instruction means good instruction in nutrition—the two are inseparable.

In the second of these editorials (1), it is stated: "Nutrition in pediatrics includes more than giving the required amounts of appropriate foods in health. It requires an understanding of metabolic changes in disease and compensating for these changes." For example, the treatment of severe diarrhea requires not only knowledge of the salt and water metabolism, but a knowledge of the techniques needed for the replacement of losses and of the practical application of the principles involved in parenteral alimentation. Only recently has it become known that it is as important to supply lost potassium as it is to replace sodium and chloride if a baby is to recover from diarrhea. In this situation, a detailed knowledge of maintenance requirements is necessary not only for water and salts but also for protein, energy, and vitamins. Knowledge of proper use of protein supplements, including the hydrolysates, is relatively new and in fact still incomplete.

"In the teaching of pediatrics some didactic instruction is necessary, but didactic training must be fully supplemented by opportunity for practical application. Instruction in infant nutrition, for example, has little meaning to the student until he is confronted with the responsibility of feeding a baby. The student will have the fullest training opportunity when he becomes an intern, but he should have as much opportunity as possible while still a student.

"Along with the teaching of nutrition in pediatrics, an understanding of the psychology of feeding has an important place. Many a child is undernourished because of chronic anorexia induced by mismanagement at meal time and emotional stresses associated with food and feeding. The teaching of nutrition in pediatrics *must* include the related psychologic aspects and the effect of emotional factors on eating. For the undergraduate medical student, such teaching may of necessity be largely by didactic discussion. For the intern and resident staff, knowledge of these related factors is to be gained through responsibility for the care of patients and the easy avail-

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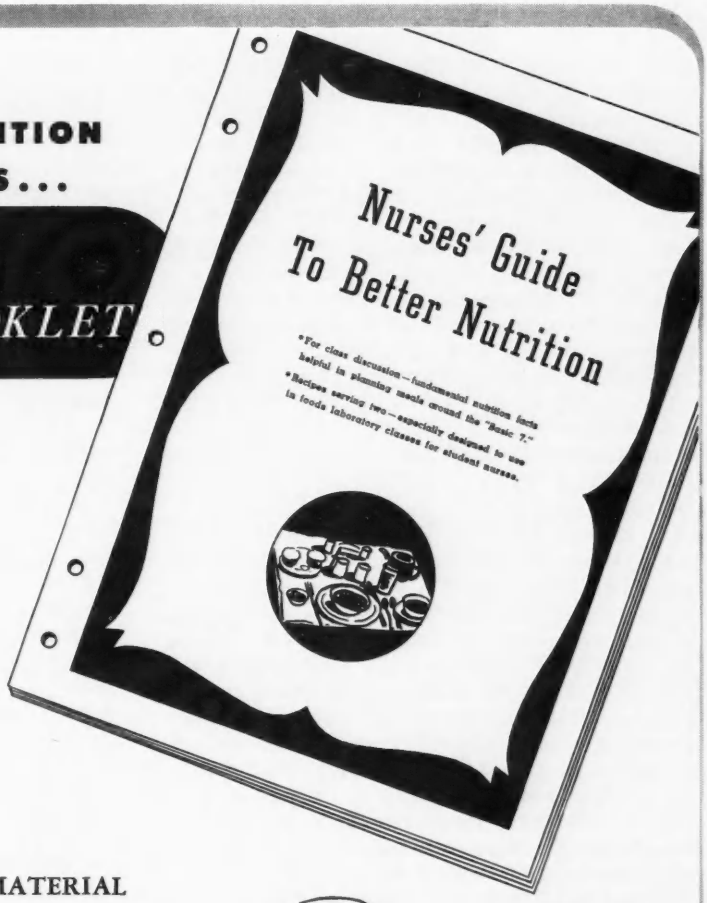
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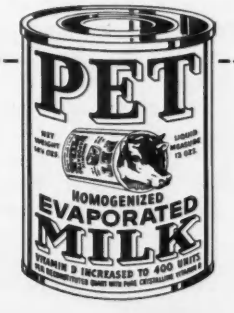

ability of experts in the field of dietetics and psychology or psychiatry. The presence of a dietitian and psychologist on regular ward rounds is helpful in this respect. The nutrition of the child should be discussed in relation to his disease, to his rehabilitation, and to his home envoronment."

The work of Tisdall, Ebbs, Burke, Stuart, Warkany, and others calling attention to the relation of nutrition to the health of the mother and baby is striking and indicates the importance of incorporating the study of nutritional requirements during pregnancy into the teaching curriculum of the medical student. It has been shown that while the total infant mortality rate has been declining, the proportion of those who died within the first month has actually increased from 52.7 to 62.1 per cent between 1925 and 1944.

NUTRITION IN OBSTETRIC TEACHING

The third editorial of this series dealt with the opportunities for nutrition during obstetric teaching in the medical school (1). "Most of the teaching on nutrition in obstetric practice should be done in the antepartum clinic and the lying-in hospital. Here the obstetrician can draw attention to the importance of adequate nutrition. Practical instruction on nutrition in obstetric practice should be just as much a part of obstetric teaching as instruction on routine urine examinations, blood pressure records, and pelvic measurements. . . . Also at the antepartum clinic practical instruction on nutrition can be given to the medical student by the obstetrician and the *dietitian*. . . . The application of this knowledge in the practice of medicine is important not only for the patient but also for future generations."

NUTRITION IN SURGICAL EDUCATION

The final editorial in this series (1) pointed up the importance of nutrition in recovery from various "surgical" diseases, stating that the surgeon himself has been forced to pay more and more attention to the diets and dietary supplements that are given his patients. This is especially true since intravenous alimentation with protein digests, plasma, and vitamins has been made available to complicate the former rather simple routines for early post-operative care that existed ten years ago. Then the only fluids given intravenously were saline solution, glucose, and whole blood.

"Formal lectures can do little more than create an interest in the subject. Detailed work on individual patients with responsibility for diets is needed, together with close observation of the patient's response to the food and other nutrients ordered. Exercises should be held with small sections of students who are working actively and constantly with the patients. Besides the instructor, residents, interns, students, and above all, a *trained dietitian* should make up the study group.

"The ground that could be covered by such a study group is much greater than the time that could possibly be allotted to it. However, some of the most important subjects that should be kept in mind are: (a) the relationships of protein, vitamins, and anemia to surgical shock; (b) the loss of protein and sodium chloride in pus and other excretions; (c) loss of weight after surgery and its prevention; (d) the relative importance of technical errors, distention, plasma protein deficiency, and ascorbic acid deficiency in wound disruption or in poor wound healing; (e) differences between the amounts and kinds of foods ordered and the foods presented to the patients; (f) differences between the amounts and kind of food presented to the patients and the foods eaten; (g) differences between the amounts and kinds of food eaten and the foods actually absorbed from the intestine; and (h) the food values in the various diets consumed and how they may be calculated."

In such a study group some consideration should be given to costs. Sometimes, as you well know, protein can be supplied by mouth in the form of dry, non-fat milk solids at about one-tenth of one cent per gram whereas if supplied in the form of plasma, given intravenously, it may cost a thousand times as much or one dollar per gram.

We are not marking time in this science of nutrition. Both the American Dietetic Association and the American Medical Association are working for the application of known knowledge now, and that application will provide what Dr. McLester proposes —"greater vigor, increased longevity, and a higher level of cultural attainment."

REFERENCE

(1) Teaching of nutrition. Editorials. J. A. M. A. 133: 1282, 1947; 134: 23, 146, 292, 1947.

A NUTRITION CLINIC FOR MEDICAL STUDENTS[1]

ELVA A. HISCOCK

Instructor in Nutrition, Department of Medicine, University of Illinois College of Medicine, Chicago

For the last five years, the University of Illinois College of Medicine, Chicago, has incorporated the teaching of nutrition in the Department of Medicine. In the senior year, quarterly clerkships are made in five clinics, including the Nutrition Clinic. Classes are held each day for a 2-hr. period, five days a week for three weeks, thus giving the student a total of 30 hr. of experience. The classes are limited in size to

[1] Presented at the 30th Annual Meeting of the American Dietetic Association in Philadelphia, on October, 16, 1947.

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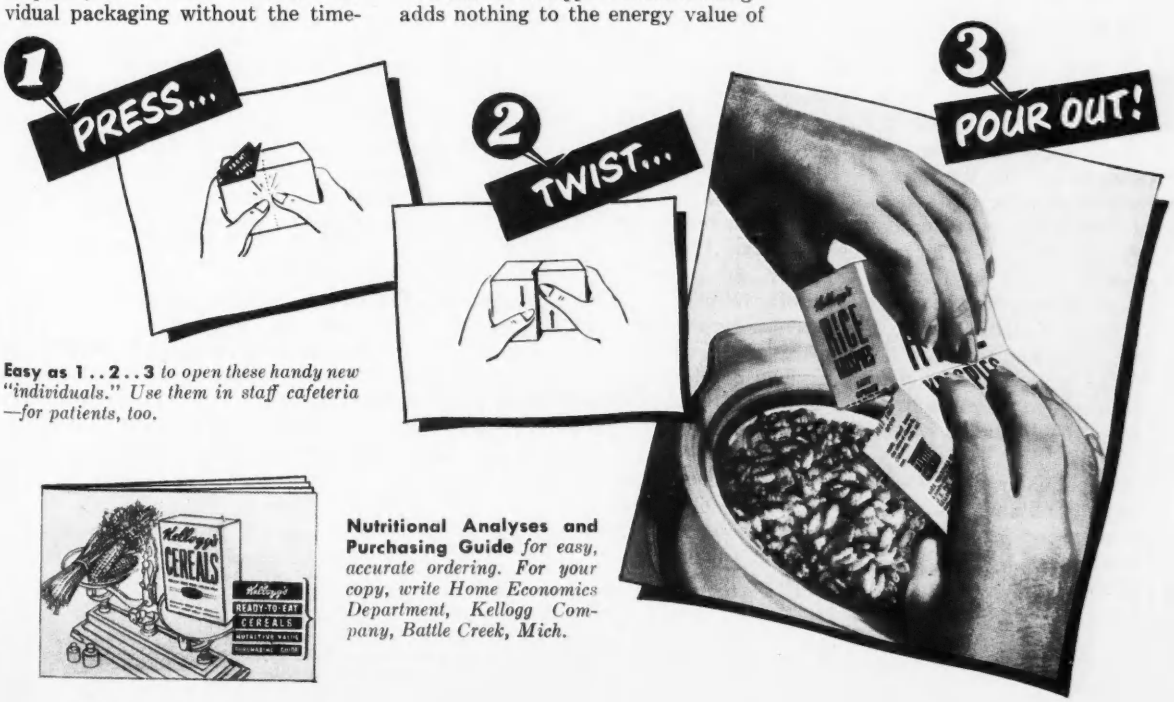

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four or less. The informal class lends itself to supervised practice in the application of theory which is of fundamental importance, for the medical student must learn to apply and correlate his knowledge of associated science with nutrition.

The primary objective of this course is to demonstrate to the medical student the application of nutrition, dietetics, and related sciences to the social, economic, and psychological aspects of controlling the patient's food intake. The senior students will have completed courses in the fundamental sciences on which the teaching of nutrition is based. Lack of experience in food preparation, marketing, and many of the subjects which are a part of the dietitian's background will be a handicap to this learning. This makes the course more important, as it may be his first experience with an objective approach to the problem of nutrition.

Classes are opened with a 30-min. discussion of such topics as: (a) the physiological needs of the body in terms of specific nutrients, and the individual variation in this requirement as affected by age, sex, and activity; (b) classification of foods as to composition and the effect of cooking, preservation, storage, and refrigeration on their nutritive value; (c) construction of diets to meet individual requirements; (d) modifications of diets in consistency, fiber, or residue; (e) calculation of the quantitative diet; (f) economic aspects of special diets and the cost of foot; (g) psychological factors of feeding; and (h) the evaluation of nutritional status.

When there is particular interest in certain topics, additional time is given to their consideration, and the students are encouraged to discuss their beliefs and interests. A reserve shelf of nutrition textbooks in the medical library is used for reference, and assignments are made therein.

At the conclusion of the lecture period, patients are admitted to the Clinic, and the practical application of theory is undertaken. Patients are referred to the Nutrition Clinic by the attending physician, and a consultation sheet is used for the referral and for the report. The diagnosis may be sufficient indication for dietary consultation, or a brief summary of the clinical findings, as related to the specific request for consideration, may be given. Before dietary instructions are given, the patient's chart is reviewed for reports from other clinics.

In the Nutrition Clinic, the patient is weighed and measured and told how he compares to the average range for age, sex, and height. The basal caloric requirement is calculated and allowance made for age, growth, and activity. Then the dietary history is taken.

In obtaining the dietary history, the student must learn to obtain accurate information, not only concerning food intake, but also the socio-economic situation of the patient. The patient's living conditions—number of rooms and type of dwelling and facilities for obtaining, preparing, and storing foods—have a vital bearing on the type of dietary recommendations which he can be expected to follow. The racial background and religious customs of the patient will also play a part in determining his ability to follow dietary instructions. From the dietary history, the student learns the patient's habits of purchasing, food preparation, menu planning, and food expenditure. Information may also be available on other factors related to nutrition, such as habits of sleep and rest, social adjustment, and family activities.

After consideration of all of these factors, oral instructions are given to the patient by the medical student, who translates medical terminology into words the patient will understand. The normal function of the gastrointestinal tract or other systems may need to be explained and how the existing conditions have impaired this function. Unless the reason is obvious, the purpose of the diet is explained. At the end of the interview the student gives the patient a copy of the diet and one is placed in the chart. In this way the record of the diet may be used by other clinics to check the patient's food intake, and it is likely that the medical student may see the patient in other clinics to which he is assigned in this medical clerkship.

It is the policy of the Nutrition Clinic to teach all diets as modifications of the normal, either in specific nutrients, consistency, fiber, or residue. When the instruction is given in this manner, the student is able to retain the information without a large amount of memory work. The practice in the past of naming diets after their originators resulted only in a confusion of ideas about foods used in the treatment of diseases, even though there was adequate reason for such labeling of food lists, for precise scientific terminology was lacking. Today, however, we find it comparatively simple to evaluate a diet with the tables of food composition which are available.

In the Nutrition Clinic at the University of Illinois College of Medicine, we try to impress upon the student the significance of the statement made by Wilder (1); "The wholehearted recognition of the significance of good nutrition for health and fitness will have come as something of a shock to those practitioners of medicine who have ignored this problem or minimized its importance. . . .Living tissue must be fed to function normally; its requirements include an adequate supply of each of many different nutrients; dietary requirements are affected by disease—usually increased—and failure to meet the requirements of the tissue must occasion some degree of malnutrition in every instance."

REFERENCE

(1) WILDER, R. M.: Foreword. *In* Wohl's Dietotherapy, Clinical Application of Modern Nutrition. Philadelphia: W. B. Saunders Co., 1947.

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Book Reviews

Food and Nutrition: The Physiological Bases of Human Nutrition. By E. W. H. Cruickshank. Baltimore: Williams & Wilkins Company, 1946. Cloth. Pp. 326. Price $4.50.

The author is Regius Professor of Physiology, University of Aberdeen. The book is not a text, but rather a survey of the topic presented for medical students and practitioners and for the general public. The author has been selective in the aspects of the subjects to be presented. The introductory historical survey is brief but excellent, as is the chapter on the Food and Agriculture Organization.

All material is simply written, factual, and practical. The chapters on diet and dental caries and on bread and high extraction flours are helpful and bring together material not readily available elsewhere.

The section on freezing of foods appears to suggest the use of sirup for peas and runner beans, but no mention is made of the use of ascorbic acid for the prevention of discoloration in fruits, such as peaches.

Two chapters are devoted to the problem of nutrition in Great Britain and British standards for nutritional adequacy are used throughout. Nevertheless, the book can be recommended for dietitians and nutritionists in this country for its world viewpoint, sound nutritional information, and excellent photographs of results of dietary deficiencies. —*Dr. E. Neige Todhunter, Head, Department of Foods and Nutrition, University of Alabama, Tuscaloosa.*

Child Care: Questions and Answers. Compiled by The Children's Welfare Federation of New York City, Dr. John Fitch Landon, Chairman. Garden City, N. Y.: Doubleday and Company, 1948. Cloth. Pp. 159. Price $2.

Answers to over four hundred questions which parents most frequently ask their doctors, nurses, educators, and social service workers are given in this book. The questions were submitted by agencies interested in the Children's Welfare Federation of New York City and were then referred to experts in the various fields of child care. The answers are the combined work of committees in the respective fields. The questions and answers are conveniently grouped under the following chapter headings: Growth Standards; Routine Care; Feeding; Development; Posture; Emotional Guidance; Medical Care; and Special Senses. Appropriate subheadings under these groupings make it possible to locate quickly a particular topic without a detailed index.

This book was originally intended as a guide to child health workers who often need to know what to say and what to leave unsaid in answer to the troublesome and sometimes trivial questions parents ask. However, parents are confronted daily with many questions which they cannot refer immediately to the child health authority. Such a book as this is a valuable supplement for parents of children up to the age of six years, since the questions are answered simply, specifically, and authoritatively.

In some instances a little more detail might have been desirable for the average reader. For example, one answer states only: "Mix formula while utensils are boiling." The method for the preparation of the formula is then given, but no information is included concerning what utensils are to be boiled. In another instance it is stated that a child may be given "a light mid-morning or afternoon snack" if it doesn't interfere with his appetitie. An illustration or two might have helped to indicate what the authors have in mind, for parents would differ greatly in the choice of such snacks. No doubt authorities will disagree with some of the answers. Many pediatricians now recommend the use of meat in the infant's diet before the tenth to twelfth month (Question 133).

Dietitians will not, as a rule, find new material in the section on feeding, but this book will prove to be a useful reference in helping to answer simply the questions parents raise. The information is practical, scientifically sound, and psychologically good. The book can be recommended to parents and child health workers alike.—*Corinne Hogden Robinson, Lecturer in Nutrition, Temple University School of Medicine, Philadelphia.*

The Pennsylvania Dutch Cook Book. By Ruth Hutchison. New York: Harper and Brothers, 1948. Cloth. Pp. 229. Price $3.

The Pennsylvania Dutch have long been noted for their particular brand of cookery, their traditionally good food, and the bounteousness with which they set their tables. Most of their recipes have been passed on to succeeding generations by word of mouth, by notes written on vague slips of paper, or have been found in old copy books which the Pennsylvania Dutch housewife kept in the drawer of her kitchen table. In each county of this region of Pennsylvania, one found almost as many variations of these basic recipes as there were cooks. These variations were determined mainly by the European background of the cook, her imagination, and the materials with which she had to work, so it is a difficult task for an individual to select a group of recipes which would be truly representative of the region as a whole.

Ruth Hutchison has been collecting these recipes over a period of years and has assembled them in *The Pennsylvania Dutch Cook Book*. It is a very interesting collection. The recipes have been rewritten according to the standard practices of today, so that they can be used with satisfactory results by practically anyone who has had no experience with the cookery of this region. The collection is fairly complete, although more emphasis is placed on the "sweets and sours" and pies and cakes rather than on some of the more hearty dishes for which these people are noted. However, there is less need today for food of this type, so its omission should not be considered too great a loss.

The only criticism it is possible to find with the book is that despite careful testing and editing of the recipes, a few inaccuracies in measurements and a few directions, such as "butter the size of a walnut," "a little water," "a half eggshell of water," and "a heaping tablespoon," or "heaping cup of flour" may still be found. In rewriting these recipes, it is to be regretted that Mrs. Hutchison was not more consistent in her corrections.

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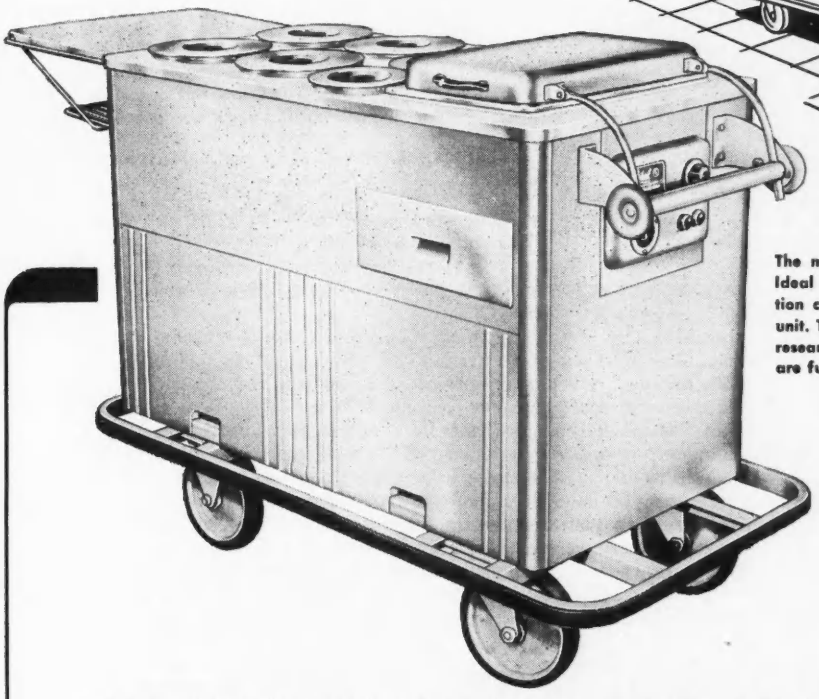

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The explanatory notes which head each chapter and accompany many of the recipes are well written and as one reads them, it is possible to understand why the Pennsylvania Dutch seemed a little queer to their less imaginative neighbors. The designs which are found on the inside of the covers and which head each chapter are typically Pennsylvania Dutch and add much to the book.

Mrs. Hutchison is to be commended for creating such an interesting and colorful cookbook. It is particularly interesting and valuable because it furnishes a true picture of a way of life which is today known only in the rural areas of this region.—*Catherine E. Louser, Chief Dietitian, Norristown State Hospital, Norristown, Pennsylvania.*

Production with Safety. By A. L. Dickie. New York: McGraw-Hill Book Company, 1947. Cloth. Pp. 242. Price $2.50.

With a plunge into the realm of imagination, the author begins his book by creating a safety engineer and obtaining a job for him. The engineer then outlines his general program, including classes with foremen and accident report forms to be used. He points out that accidents refer not only to men but also to tools, machines, equipment, and materials. Then he proceeds to indoctrinate the twenty-six foremen, since all those in supervisory positions must understand the safety program and assist in enforcing it.

In this series of discussions, one of the lectures is devoted to the high cost of accidents. In 1940 the appalling accident toll was $257 million for compensation paid to injured workers plus $80 million for medical expenses. This is not the complete story; hidden costs of accidents amount to four times the dollar value.

Although written primarily for industry, dietitians in hospitals and colleges will see many parallel circumstances and principles applicable in their own institutions. Written in a concise, readable style, this book should be worth while for all supervisors and personnel managers.—*Janet Engebretsen, Associate Dietitian, The Johns Hopkins Hospital, Baltimore.*

Nutrition and Hormones. By Leo T. Samuels, Ph.D. Publication No. 11, American Lecture Series. Springfield, Ill.: Charles C. Thomas, 1948. Simulated leather. Pp. 48. Price $1.50.

Nutrition is a factor which affects hormone production, the hormones of the pituitary being sensitive to deficiencies in calories or protein; and the adrenal is affected by restriction of pantothenic acid. The endocrines on the other hand affect the state of nutrition; the hypothalmus contains a center which depresses hunger and the pituitary growth hormone is essential for protein anabolism. The interrelations of nutrition and the pancreas, thyroid, adrenal cortex, gonadal hormones, and anterior hypophysis are presented in this booklet with experimental data and excellent charts and photographs.

This presentation will be of particular interest to the therapeutic dietitian concerned with the feeding of patients with endocrine disturbances.—*Dr. E. Neige Todhunter, Head, Department of Foods and Nutrition, University of Alabama, Tuscaloosa.*

Diet in Pregnancy

DeLee and Greenhill say, concerning the diet in pregnancy, "According to the Committee on Food and Nutrition, National Research Council, the average daily requirement during the latter half of pregnancy is 2,500 calories. The Council specified that the daily requirement of protein is 85 gm. but it did not indicate the amounts of carbohydrate and fat." Becker, Bickerstaff, and Eastman state that the daily requirements for nonpregnant adults should be taken by pregnant women, namely from 50 to 70 per cent of the total calories as carbohydrate and from 20 to 35 per cent as fat. The tendency in pregnancy has been to restrict protein because of the fear that proteins are an etiologic factor in the development of toxemia. However, in pregnancy, there is a greatly increased demand for proteins, and unless this is met, the results may be nutritional edema and anemia (Arnell and Guerriero). Furthermore, Hunscher and her associates have shown that the greater retention of nitrogen in the latter half of pregnancy, the better the outlook for a good supply of milk. Hence, a liberal supply of nitrogen rather than a restricted amount should be recommended to pregnant women. On the other hand, sodium in the form of table salt, sodium bicarbonate, and other alkalis containing sodium should be curtailed because excessive amounts may produce edema and lead to toxemia (de Snoo and Strauss). "At least five full glasses of water should be taken daily in addition to a quart of milk."

In the discussion of the treatment of preeclampsia, these authors say, "The patient should be instructed to omit table salt from all food either during cooking or at the table. She must not eat salty food, such as ham, crackers, salt fish, and pretzels." Likewise, she must not take sodium bicarbonate, citrocarbonate, or any "patent" medicine which contains alkaline salts. Strauss believes that 15 per cent of all women with toxemia of pregnancy suffer from water retention.

In a paper on "Toxemia of Pregnancy, Types, Etiology, and Treatment," M. B. Strauss said, "Since hypoproteinemia is one of the more important factors which permit the development of water retention, adequate prepartum care must include attention to the prevention of this condition. Although disturbances of absorption, assimilation, manufacture, and urinary loss of protein may be involved, it appears that the chief cause of hypoproteinemia in pregnancy lies in inadequate dietary intake of protein of good biologic value, especially in view of the increased demands for protein for the developing fetus and also for the maternal organism. It is therefore of paramount importance that the diet in pregnancy contain more, not less, protein than an adequate diet for nonpregnant subjects. It is likewise important that the pregnant woman avoid an excessive intake of sodium salts under any conditions, and, if she has low plasma proteins, sodium restriction must be used. Anemia, which is conducive to water retention, is to be avoided by proper prophylactic measures."—*From Queries and Minor Notes, J.A.M.A. 135: 1122 (December 20), 1947.*

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TENTATIVE PROGRAM, THIRTY-FIRST ANNUAL MEETING THE AMERICAN DIETETIC ASSOCIATION MECHANICS BUILDING, BOSTON OCTOBER 18-22, 1948

Pre-Convention Meetings

Sunday, October 17

9:00 a.m.—CONFERENCE OF DIRECTORS OF APPROVED INTERNSHIPS, Hotel Statler

1:00 p.m.—MEETING OF REORGANIZATION AND CONSTITUTION REVISION COMMITTEE

3:00 p.m.—MEMORIAL SERVICE HONORING THE LATE MISS FRANCES STERN

Monday, October 18

9:00 a.m.—MEETING OF THE HOUSE OF DELEGATES, Georgian Room, Hotel Statler, Helen A. Hunscher, PhD., *presiding*

4:00 p.m.—MEETING OF MEMBERS OF ASSOCIATION, Hotel Statler

8:00 p.m.—MEETING OF THE OFFICERS OF STATE ASSOCIATIONS, Georgian Room, Hotel Statler, Helen E. Walsh *presiding*

Tuesday, October 19

9:00 a.m.—REGISTRATION, Mechanics Building

10:00 a.m.—PUBLIC RELATIONS MEETING for State Public Relations Chairmen, State Publicity Chairmen, Editors of State Bulletins, State Presidents, etc., Ballroom Assembly, Hotel Statler, Elizabeth Perry *presiding.*

12:30 p.m.—NEW ENGLAND STATES LUNCHEON, Imperial Ballroom, Hotel Statler, Alice M. Fenno *presiding*

Our New England Heritage, Charles S. Tapley, Danvers, Massachusetts

3:00 p.m.—OPENING MEETING, Grand Hall, Mechanics Building, Helen E. Walsh *presiding*

Volta R. Hall, M.D., Consulting Psychiatrist, Massachusetts Society for Mental Hygiene, Boston

(Other speakers to be announced)

4:30 p.m.—MEMBER DISCUSSION, Constitution Revision and Reorganization, Paul Revere Hall, Mechanics Building

8:00 p.m.—PUBLIC RELATIONS MEETING, Imperial Ballroom, Hotel Statler, Helen Robertson *presiding*

Joseph Boyle, Vice President, J. Walter Thompson Company, New York City

Anthony W. Eckert, Administrator, Fitkin Memorial Hospital, Neptune, New Jersey

Wednesday, October 20

8:00 a.m.—VOCATIONAL GUIDANCE BREAKFAST AND MEETING, Ballroom Assembly, Hotel Statler, Marjorie Hall Siler *presiding*

9:00 a.m.—HISTORY OF NUTRITION AND DIETETICS, Georgian Room, Hotel Staler, Helen S. Mitchell, Ph.D., *presiding*

Landmarks in the History of Nutritional Anemias, William B. Castle, M.D., Professor of Medicine, Harvard University, Boston

The Historical Development of Metabolism Studies, Thorne M. Carpenter, Ph.D., Former Director, Nutrition Laboratory, Boston

The Development of the Present Treatment of Diabetes, Elliott P. Joslin, M.D., Medical Director, George F. Baker Clinic, New England Deaconess Hospital, Boston

9:30 a.m.—LAYOUTS AND MANAGEMENT, Grand Hall, Mechanics Building, Marion D. Floyd, *presiding*

William A. Riley, Curtin and Riley Architects, Boston

Clarice D. Gullickson, Chief, Dietetic Administration Section Dietetic Division, Veterans Administration, Washington, D. C.

M. W. Wall, Manager, New England Branch, S. Blickman, Inc., Boston

A. G. Francis, Director of Dining Services, Illinois Bell Telephone Company, Chicago

10:00 a.m.—TEACHING NUTRITION AND DIETETICS TO STUDENT NURSES, Paul Revere Hall, Mechanics Building

Discussion Panel: Professional Education Project, Instruction for Student Nurses and Evaluation of Outcome, Anne Hurevitz, Teaching Dietitian, Jewish Hospital of Brooklyn, Brooklyn *chairman*

Louise Irwin, Therapeutic Dietitian, Indiana University Medical Center, Indianapolis

Henderika J. Rynbergen, New York Hospital, New York City.

10:30 a.m.—RESEARCH, Parlor A, Hotel Statler, Hazel E. Munsell, Ph.D., *presiding*

The Dietary Treatment of Hypertension, James H. Currens, M.D., Massachusetts General Hospital, Boston

The Occurrence of Sodium in Foods, Charles E. Bills, Ph.D., Mead Johnson and Company, Evansville, Indiana

The Composition of Foods in Foreign Dietaries, Robert S. Harris, Ph.D., Professor

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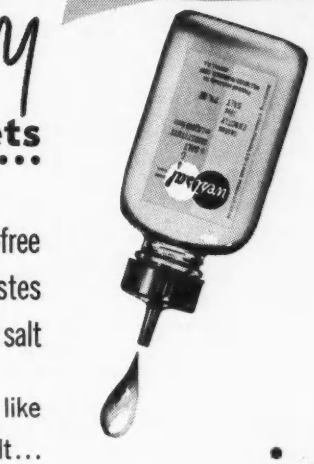

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of Biochemistry of Nutrition, Massachusetts Institute of Technology, Cambridge

12:00 noon EXHIBITORS' LUNCHEON, Imperial Ballroom, Hotel Statler, Lillian S. Coover, Ph.D., *presiding*

3:00 p.m.—DIET THERAPY MEETING, Imperial Ballroom, Hotel Statler, Beula B. Marble, *presiding*

Oral and Intravenous Feeding of Fats to Patients, Fredrick J. Stare, M.D., School of Public Health, Harvard University, Boston

New Developments in the Treatment of Renal-Vascular Diseases, George W. Thorn, M.D., Hersey Professor of the Theory and Practice of Physics, Medical School, Harvard University, Boston

Cholesterol as Related to Diet Therapy, George V. Mann, M.D., School of Public Health, Harvard University, Boston

3:00 p.m.—SCHOOL LUNCH AND COLLEGE FOOD SERVICE, Grand Hall, Mechanics Building, Mary DeGarmo Bryan, Ph.D., *presiding*

Marita Monroe, Director, Residence Halls, University of Missouri, Columbia

Mildred Jones, Manager, Women's Residence Halls, Michigan State College, East Lansing

(Other speakers to be announced)

3:00 p.m.—DIETARY SERVICE IN INSTITUTIONS, Paul Revere Hall, Mechanics Building, Wilma F. Robinson *presiding*

Survey of Practices in Feeding in Tuberculosis Hospitals, Esther Penci, State Tuberculosis Hospital, Ray Brook, New York

Geraldine Piper, Oklahoma State Department of Health, Oklahoma City

(Other speakers to be announced)

4:30 p.m.—TEACHING NUTRITION AND DIETETICS TO MEDICAL STUDENTS, Ballroom Assembly, Hotel Statler, Frances MacKinnon, *presiding*

John B. Youmans, M.D., Dean, University of Illinois College of Medicine, Chicago

Fredrick J. Stare, M.D., School of Public Health, Harvard University, Boston

Martha Nelson Lewis, Director, Dietary Department, University Hospital, The Ohio State University, Columbus

8:00 p.m.—NEW ADVANCES IN NUTRITION, Imperial Ballroom, Hotel Statler, E. Neige Todhunter, Ph.D., *presiding*

New Advances in Nutrition, Charles G. King, Ph.D., Scientific Director, the Nutrition Foundation, Inc., New York City

The Revised Recommended Dietary Allowances of the National Research Council, P. C. Jeans, M.D., Professor of Pediatrics, Children's Hospital, State University of Iowa, Iowa City

Translating Dietary Allowances into Foods and Diets, Leonard A. Maynard, Ph.D., D.Sc., Director, School of Nutrition, Cornell University, Ithaca, New York

E. M. Nelson, Ph.D., Chief, Division of Vitamins, Food and Drug Administration, Washington, D. C.

Thursday, October 21

8:30 a.m.—MEETING OF THE HOUSE OF DELEGATES, Salle Moderne, Hotel Statler, Helen A. Hunscher, Ph.D., *presiding*

9:00 a.m.—FOOD CLINIC CONFERENCE, Lobby Salon, Hotel Bradford, Eloise R. Trescher, *presiding*

Report on Study of Low-Sodium Diets for Ambulatory Hypertension Patients, David Ayman, M.D., Chief, Hypertension Clinic, Beth Israel Hospital, Boston

(Other speakers to be announced)

9:30 a.m.—PERSONNEL, Grand Hall, Mechanics Building, Ruth W. Spencer, *presiding*

Cooperation, F. Alexander Magoun, Professor of Humanics, Massachusetts Institute of Technology, Cambridge

Supervisory Development, Eldon E. Sweezy, Training Officer, Civil Aeronautics Administration, Washington, D. C.

9:30 a.m.—COMMUNITY TEACHING, Paul Revere Hall, Mechanics Building

Pauline Murrah, Director of Nutrition Service, The American National Red Cross, Washington, D. C.

(Other speakers to be announced)

12:30 p.m.—PRESS RELATIONS LUNCHEON, Salle Moderne, Hotel Statler, Mary P. Huddleson, *presiding*

3:00 p.m.—MEETING OF COLLEGE AND UNIVERSITY HOME ECONOMICS FACULTIES AND DIRECTORS OF APPROVED DIETETIC INTERNSHIPS, Salle Moderne, Hotel Statler, Ercel S. Eppright, Ph.D., *presiding*

Discussion Report of Progress from The A.H.E.A. Committee on Criteria for Evaluating College Programs of Home Economics, Marie Dye, Ph.D., Dean, School of Home Economics, Michigan State College, East Lansing

Curriculum Problems, Encountered by the Membership Committee of The A.D.A., Lillian S. Coover, Ph.D., Secretary, The American Dietetic Association, Chicago

3:00 p.m.—MATERNAL AND CHILD HEALTH, Grand Hall, Mechanics Building, Bertha S. Burke, *presiding*

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½ teaspoon cinnamon
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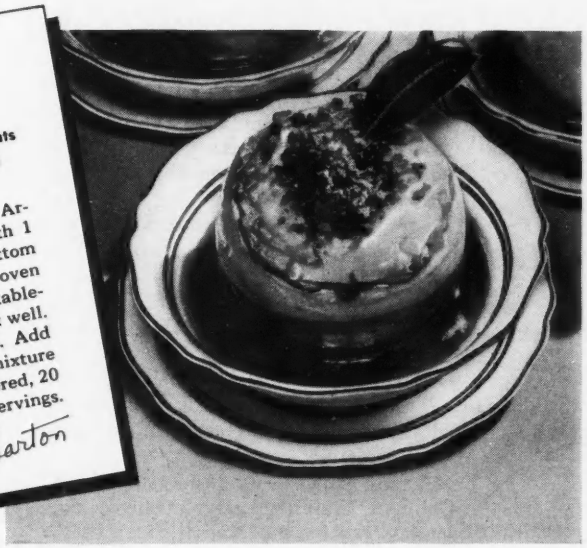
Frances Barton



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lems, Harold C. Stuart, M.D., Professor of Maternal and Child Health, Medical School, Harvard University, Boston

How to Evaluate Signs and Symptoms of Nutritional Deficiency in the Pregnant Woman, Nevin S. Scrimshaw, Ph.D., M.D., University of Rochester School of Medicine and Dentistry, Rochester, New York

Recent Observations on Effect of Maternal Nutrition Upon Pregnancy and the Newborn Infant, Clement Smith, M.D., Director of Research on the Newborn, Boston Lying-In Hospital and Assistant Professor, Medical School, Harvard University, Boston

A Comparison of Breast and Artificial Feeding, Stuart S. Stevenson, M.D., Assistant Professor of Child Health, School of Public Health, Harvard University, Boston

3:00 p.m.—TRAINING FOOD SERVICE EMPLOYEES, Paul Revere Hall, Mechanics Building, Mary McKelvey, *presiding*

Developing Supervisory Leadership, L. H. Coffman, Training Analyst, Office of Personnel, Veterans Administration, Washington, D. C.

Training—Are Planned Programs Practical?, Eleanore J. Miller, The Stouffer Corporation, Cleveland, Ohio

Training Programs for Subsidiary Workers in Hospitals, Janette C. Carlsen, The Johns Hopkins Hospital, Baltimore, Maryland

MEETING AND BUFFET SUPPER FOR DIETITIANS WITH THE VETERANS ADMINISTRATION, Bedford, Massachusetts

8:00 p.m.—OPEN MEETING, Grand Hall, Mechanics Building, Adelia M. Beeuwkes, *presiding*

Friday, October 22

9:00 a.m.—QUALITY FOOD PRODUCTION AND SERVICE, Georgian Room, Hotel Statler

Hazel M. Fullriede, Withrow High School Cafeteria, Cincinnati

Mary Harman Riste, Butterworth Hospital, Grand Rapids, Michigan

Alice Easton, Food Consultant, H. A. Johnson Co., Boston

9:00 a.m.—COMMUNITY NUTRITION MEETING, Paul Revere Hall, Mechanics Building, Elda Robb, Ph.D., *presiding*

9:30 a.m.—DIET THERAPY MEETING, Grand Hall, Mechanics Building, Doris Johnson, *presiding*

Priscilla F. White, M.D., 81 Bay State Road, Boston

Alexander Marble, M.D., 81 Bay State Road, Boston

Report on the Diet Section of the Handbook of Diabetes, Frank N. Allen, M.D., Executive Director, Medical Department, Lahey Clinic, Boston

10:30 a.m.—CHILD FEEDING PRACTICES, Ballroom Assembly, Hotel Statler, Miriam E. Lowenberg, Ph.D., *presiding*

Isabelle M. Jordan, R.N., Specialist in Nursing Care for Children, U. S. Children's Bureau, Federal Security Agency, Washington, D. C.

Eva M. Ylvisaker, Head Dietitian, Children's Hospital, Cincinnati, Ohio

Lorraine Weng, University of Chicago Clinics, Chicago

10:30 a.m.—FOOD SERVICE TO HOSPITAL PERSONNEL, Parlor A, Hotel Statler, Beulah Hunzicker, *presiding*

2:30 p.m.—COMMUNITY NUTRITION MEETING, Paul Revere Hall, Mechanics Building,

Report on Project on Consumer Education on Enriched and Fortified Products, Marguerite L. Pettee, Chief Nutritionist, Medical College of Virginia, Richmond.

Edemic Goiter, A Food Deficiency Disease O. P. Kimball, M.D., Cleveland, Ohio

Bread Enrichment, Captain John A. Fields, New York State Department of Mental Hygiene, Albany

3:00 p.m.—PURCHASING, Grand Hall, Mechanics Building, Fern W. Gleiser, *presiding*

Roger Preston, President, S. S. Pierce Company, Boston

(Other speakers to be announced)

3:30 p.m.—THE MOTIVATION OF HUMAN BEINGS, Ballroom Assembly, Hotel Statler, Florance B. King, Ph.D., *presiding*

Anthropological Viewpoint, Margaret Mead, Ph.D., D.Sc., Associate Curator of Ethnology, Department of Anthropology, The American Museum of Natural History, New York City

Group Dynamics, Alex Bavelas, Industrial Relations Section, Massachusetts Institute of Technology, Cambridge

Educational Viewpoint, Mary E. Spencer, Ph.D., Chief, Bureau of Health Information, Massachusetts Department of Public Health, Boston

Social Service, Ethel Walsh, Social Worker, Peter Bent Brigham Hospital, Boston

7:30 p.m.—ANNUAL BANQUET, Imperial Ballroom, Hotel Statler, Helen A. Hunscher, Ph.D., *presiding*

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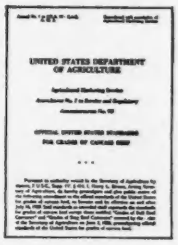

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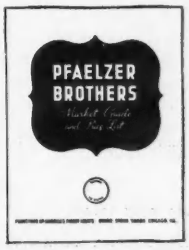

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Current Literature

Contributed by Janette C. Carlsen and Ethel M. Miller, Dietary Department, The Johns Hopkins Hospital; Mrs. Quindara Oliver Dodge, Women's Educational and Industrial Union, Boston; and the Journal Staff.

THE AMERICAN JOURNAL OF NURSING

Vol. 48, June, 1948

An evaluation of folic acid. R. W. Heinle.—p. 381.

Vol. 48, July, 1948

*Protein metabolism in surgical patients. S. M. Levenson and C. C. Lund.—p. 415.

*Nutrition education and public health nursing. F. N. Shoun and J. W. Jones.—p. 430.

Protein and Surgery. This review of protein metabolism in surgical patients takes into consideration the following factors: (a) causes of protein deficiency, (b) results of protein deficiency under various physical conditions, (c) evaluation of protein deficiency, and (d) treatment in protein deficiency. The discussion of the last-mentioned factor, treatment, is concerned particularly with the different methods of supplying protein foods. Precautions are given in regard to the use of protein supplements, gavage feedings, and intravenous feedings.

Nutrition Education in Tennessee. The Tennessee Department of Health has made nutrition education an important part of its total health program. Four nutrition consultants are now on the staff and have the responsibility of expanding and developing the nutritional programs of state and local public health organizations. Illustrations are given in this article of the cooperation between the nutrition consultants and the public health nurses who are the natural channels for disseminating nutrition information. Teamwork is evidenced in the descriptions of home visits and formal staff conferences. The work of the nutritionists is further portrayed in regard to the following: (a) instruction of student nurses in the field; (b) teaching in clinics; (c) participating in health conferences with the dentist, local nurse, and health officer; (d) advising on school health and nutrition; and (e) assisting in other activities such as industrial feeding problems and food budgets for welfare cases. Attention is called also to the field training program for graduates in public health nutrition, offered by the state. The graduate course in community nutrition, which has been in progress at the University of Tennessee in Knoxville, is described, as is the workshop in camp leadership, where a state nutritionist serves as a consultant.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 38, June, 1948

*The sanitary engineer in hospital construction and maintenance. A. H. Wieters.—p. 770.

*Mass control of dental caries through the use of domestic water supplies containing fluorine. F. S. McKay.—p. 828.

The Sanitary Engineer. In view of the greatest hospital construction program in the history of this country, provided by the passage of the Hospital Survey and Construction Act, the services of sanitary engineers should be utilized in two ways: (a) in design, maintenance, and operation of facilities and equipment which comes more or less within the scope of his usual activities; (b) in cooperating with the medical and allied professions in further study of potential health hazards in the environment of the patient. The site, plumbing, food handling, garbage and waste disposal, lighting, heating and ventilation, laundry, sterilization equipment, general sanitation, as well as the spread of disease are all the concern of the sanitary engineer. The state and local health department sanitary engineers should be available to review plans and specifications, from a sanitation standpoint, for new construction and for revamping existing structures; to make sanitary surveys of existing hospitals and advise as to physical changes and operation procedures which would improve sanitary conditions; to advise and guide personnel who are responsible for operation and maintenance of equipment; to participate in in-service training of employees; and to study means of improving hospital sanitation.

Control of Dental Caries with Fluorine. The chief research project in dentistry has been and still is to determine the cause of tooth decay and to devise means for its elimination. Since the addition of fluorine to drinking water in Colorado Springs, a lower incidence of dental caries compared with the average of other cities has been recorded. Included in this article are tables which set forth data collected during the past three years in Colorado Springs. These data indicate that the inhibitory effect of fluorine, once acquired, is permanent and is not diminished by later migrations. This report and those made in other communities using fluorinated water supplies have shown that the average decay rate remains consistently low, and that about one-third of the native persons are caries-free.

ANALYTICAL CHEMISTRY

Vol. 20, May, 1948

Determination of water in dry food materials. C. W. Schroeder and J. H. Nair.—p. 452.

Determination of alcohol-insoluble solids and sugar contents of vegetables. J. C. Moyer and K. C. Holgate.—p. 472.

Vol. 20, June, 1948

Spectrophotometric estimation of tryptophan. D. C. Carpenter.—p. 536.

Vol. 20, July, 1948

*Estimation of ascorbic acid in food preparations. S. A. Goldblith and R. S. Harris.—p. 649.

Ascorbic Acid in Food Preparations. Observations have been made which suggest that in the determination of ascorbic acid, use of both the indophenol method and the 2,4-dinitrophenylhydrazine method might give not only information on the biological potency of a plant food at the

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time of analysis but also an indication of the original potency of this food when taken from the soil. This study was designed to test the validity of these concepts and to provide supplemental data on the proper method of extraction and stabilization of ascorbic acid from plant materials. It was found that the dinitrophenylhydrazine method under proper conditions will give, in stored foods, the ascorbic acid content of these foods when they were fresh. Both methods should prove useful in checking the freshness of perishable vegetables.

ARCHIVES OF PEDIATRICS

Vol. 65, April, 1948

*Rice sensitivity in children. L. Slobody, S. Untracht, and F. Hertzmark.—p. 183.

Rice Sensitivity in Children. After giving a brief resumé of the advantages of rice, the authors present a report dealing with the incidence of allergy to rice in normal and allergic children as compared with the incidence of allergy to other cereals. These data suggest that sensitivity to rice is relatively infrequent in normal individuals. In allergic individuals reactions to wheat exceed all others by a great margin; reactions to rice are not significantly less prevalent than reactions to corn, barley, oats, or buckwheat. It was also observed that children potentially allergic to rice tolerate it when it is denatured by cooking in the presence of moisture.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 137, June 19, 1948

Intravenous nutrition. Editorial.—p. 702.

Vol. 137, June 26, 1948

Nutritional inferiority of vegetable proteins. Editorial.—p. 790.

Vol. 137, July 3, 1948

Folic acid therapy. S. D. Jacobson, L. Berman, A. R. Axelrod, and E. C. vonder Heide.—p. 825.

*Tooth decay in relation to diet and general health. N. P. Larsen.—p. 832.

*Efficiency of gastrointestinal tract after resection of head of pancreas. E. E. Wollaeger, M. W. Comfort, O. T. Clagett, and A. E. Osterberg.—p. 838.

Tooth Decay and Diet. In Hawaii the abnormally high percentage of tooth decay in some groups and the freedom from decay in others presents an unusual opportunity for dental observation. Previous studies in Hawaii have shown that a change from a high-acid residue starch diet to a high-alkaline starch diet almost completely corrected tooth decay and that the alkaline and acid factors of diet were important. The study reported here was based on the findings in 866 children, six months to eighteen years of age. Results of the physical and dental examinations are given, and the diets of the various racial groups are discussed. It was concluded that oxalates and fluorides as well as the alkaline residue food values accounted for decay resistance in certain groups in Hawaii.

Resection of Head of Pancreas and Gastrointestinal Efficiency. When resection of the head of the pancreas is carried out, the operative procedure includes partial gastrectomy, total duodenectomy, or some sort of anastomosis between the biliary tract and the stomach or small intestine. Such extensive surgery cannot be done without interfering to some degree with the normal functioning of the gastrointestinal tract. In order to assess the degree of impairment of digestive and absorptive functions and to evaluate ways by which such impairment of function could be reduced, intake-excretion studies were made on ten patients, using standard test diets. A table is included in the article which lists the compositions of the four test diets used in the study. They consisted of bland, easily digestible foods, low in bulk. It was found that although an increase in the dietary fat and protein resulted in an increased wastage of fat and protein in the feces, it also resulted in an increase in the amount of these foods which was assimilated. By taking diets high in calories, protein, and carbohydrate, and low in fat, and by taking pancreatin if impairment of gastrointestinal function was great, most patients who had undergone resection of the head of the pancreas were able to maintain a satisfactory nutritional status.

THE JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 174, June, 1948

*The vitamin A content of fetal rats from mothers on a high cholesterol diet. M. B. Williamson.—p. 631.

Cholesterol Diet and Fetal Vitamin A. Reports indicate that the concentration of vitamin A in fetal liver and plasma is considerably lower than that found in maternal liver and plasma. Recently it has been shown that the lipid concentration in the placenta influences the movement of maternal nutrients to the fetus. In the present experiment an attempt was made to determine the effect of a high concentration of lipid in the placenta on the movement of vitamin A from the mother to the fetus. Female rats were fed a basal diet to which cholesterol was added. It was found that the placentae of the cholesterol-fed mothers contained twice as much lipid as those of the control mothers. The fetuses from the cholesterol-fed mothers contained significantly less vitamin A than those from the control mothers. Evidently fatty placentae inhibit the movement of vitamin A from the maternal circulation to the fetus.

JOURNAL OF THE CANADIAN DIETETIC ASSOCIATION

Vol. 9, March, 1948

The financial status of secondary school cafeterias. D. J. Tyers.—p. 129.

*The ascorbic content of citrus fruits and juices. W. M. Johnstone and M. W. Galloway.—p. 134.

Ascorbic Acid in Citrus Fruits. A survey was made in Toronto, Canada, of the relative costs, both in terms of edible portions and ascorbic acid, of oranges and grapefruit. Two tables are given which list the results obtained on peeled orange and grapefruit and on the unstrained juice from these two fruits. Data on the ascorbic acid content of canned citrus juices and fresh citrus juices are given in two other tables. Conclusions show that on a one cent cost basis, 41 per cent more ascorbic acid is obtained if peeled whole orange is consumed rather than unstrained orange juice. Fresh grapefruit, purchased as size 96 per crate, contained 81 per cent more edible fruit and 66 per cent more ascorbic acid on a one cent cost basis than larger sizes (64–80 per crate) of grapefruit. Of the canned citrus juices, grapefruit juice provided more volume and a greater amount of ascorbic acid per cost unit than did orange juice, or mixed grapefruit and orange juice.

JOURNAL OF HOME ECONOMICS

Vol. 40, May, 1948

*About frozen foods and freezing them. A symposium.—p. 233.

*Reconstituted dried whole milk as a beverage. V. M. Schroeder and D. L. Hussemann.—p. 249.

*Nutrition education needs. M. S. Follstad.—p. 258.

Frozen Foods. The symposium presented here consists of articles by authorities on frozen foods. The first report by Donald K. Tressler, consulting food technologist, is concerned with procedures which will obtain and retain the best flavor in frozen fruits and vegetables and still retain the highest quality product. The second article, by J. G. Woodroof of the Georgia Experiment Station, deals with the preparation of fruits and vegetables which are suitable for freezing. A report on the freezing of poultry is given

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by Helen L. Hanson of the Western Regional Research Laboratory in California. The subject of freezing meat is handled by Gladys E. Vail, Kansas State College. Frozen food specialities, which include frozen cooked and prepared foods such as gravies and creamed dishes, are discussed by Faith Fenton of Cornell University. The last article in the symposium, on packaging frozen foods, is reviewed by G. H. Sullivan of the Frozen Food Foundation, Inc., in Syracuse, New York. Although the suggestions given in these reports are directed to homemakers, many of them can be applied by the dietitian in institutional food service.

Reconstituted Dried Whole Milk. Although much work has been done toward improving the palatability and keeping qualities of dried whole milk, little has been accomplished on its acceptability and the practicality of reconstituting it. This study was made to develop a method suitable for reconstituting the milk powder in the home, and to compare the resulting beverage with other milks on the market. The most satisfactory method of mixing the milk powder is described. Tasters found significant differences between the samples of reconstituted dried whole milk, reconstituted evaporated milk, and fresh pasteurized homogenized milk. Fresh milk rated first, and reconstituted dried whole milk rated second. When equal parts of fresh milk and reconstituted dried milk were mixed together, tasters could not distinguish between the combined product and samples of fresh milk. It would seem, therefore, that the combined product could be used in extending existing supplies of fresh milk. It is suggested that if such were the case, possible legal restriction and labeling regulations would need to be investigated.

Nutrition Education. A study was made by The Tuberculosis Institute in three of its chest clinics, located outside the city of Chicago, to determine the effectiveness of nutrition conferences. These conferences were given to groups of patients when they came to the chest clinics. Tabulated data gathered from the first 100 patients interviewed showed that most of them were eating very inadequate diets. These observations indicate specific needs, both in educational programs and in allowances made for food budgets of many families when the wage earner has been stricken with tuberculosis. The author believes that much could be accomplished in the promotion of better dietary habits if people could be reached in a more personal way. Individual conferences, although time-consuming and expensive, might be far more effective than the group conferences usually employed.

THE JOURNAL OF NUTRITION

Vol. 35, June, 1948

*The nutritive value of cereal proteins in human subjects. C. A. Kuether and V. C. Myers.—p. 651.
*The role of thyroid activity in the pathogenesis of hepatic lesions due to choline and cystine deficiency. P. Handler and R. H. Follis, Jr.—p. 669.
The lysine, methionine and threonine content of meats. I. T. Greenhut, R. J. Sirny, and C. A. Elvehjem.—p. 689.
Relative significance of growth and metabolic rate upon the utilization of vitamin A by the rat. R. M. Johnson and C. A. Baumann.—p. 703.
*Iron and copper metabolism of young women on self-selected diets. F. Holt and F. I. Scoular.—p. 717.

Cereal Proteins. Certain oat, corn, and wheat cereals have been compared with the unprocessed cereals with respect to their ability to maintain nitrogen equilibrium in the human adult. Eight subjects were used in the study. The following conclusions appear justified on the basis of the data presented: (a) Rolled oats and exploded oat cereal, as sources of nitrogen, were equally well utilized when they furnished 55, 80, or 100 per cent of the total dietary nitrogen, the remainder of the nitrogen being furnished by milk. At the level of protein intake used in this study both of the oat cereals furnished suboptimal amounts of lysine. (b) Both wheat flakes and exploded wheat were inferior to unprocessed whole wheat in the maintenance of nitrogen equilibrium. The wheat flakes, however, were definitely better in this respect than the exploded wheat. (c) The nitrogen of the expanded corn cereal and corn flakes was practically identical with that of unprocessed whole corn in its ability to maintain nitrogen equilibrium.

Choline and Cystine Deficiency. According to this report, a decreased level of thyroid activity, induced by thyroidectomy, thiouracil, or para-aminobenzoic acid feeding, appears to protect rats against development of hepatic necrosis or fibrosis associated with choline and cystine deficiencies. The effects of thyroid feeding and of variations in the protein and fat content of the diets of rats deficient in cystine and choline are discussed.

Iron and Copper Metabolism. The subjects used in this study were young college women who were living in the Home Management House Duplex, North Texas State College, at the time of their participation in the study. All food, feces, and urine were analyzed for iron and copper. A record was kept of the number of glasses of milk consumed by each girl each day, since this was the only variable in the daily food intake. Suitable additions were then made to each individual's food intake to include the milk. The average daily intake of iron was 9.6 mg.; and the average dairly intake of copper was 8.1 mg. There were no consistent increases in the excretion of iron and copper when the intakes were increased. In all instances the total excretion of iron exceeded that of copper. However, increased intakes of both iron and copper usually resulted in increased retentions of each. All of the subjects were in positive iron and copper balance.

NUTRITION, DIETETICS, CATERING

Vol. 2, Spring, 1948

*The present training of dietitians and future scope for dietitians.
United States of America. B. F. Beilfuss.—p. 34.
Canada. L. B. Pett, G. L. Duggan, M. Macbeth, and D. McNaughton.—p. 36.
Australia. M. Rouse.—p. 38.

Vol. 2, Summer, 1948

*Dietary requirements. J. Yudkin.—p. 43.

Training of Dietitians in Different Countries. The three articles presented here give an interesting comparison of the training and professional activities of the dietitians in the U.S., in Canada, and in Australia. The organization of the various national dietetic associations is explained, and the opportunities for the dietitians in each country are discussed.

Dietary Requirements. This general discussion of the meaning of the term "requirements" for individual nutrients is divided into the following subtopics: (a) methods of determining requirements, (b) optimal and minimal requirements, (c) variation in requirements, (d) changes in requirements, and (e) dietary adaptation. The author's interpretation of nutritional requirements is based on the Recommended Allowances established by the National Research Council.

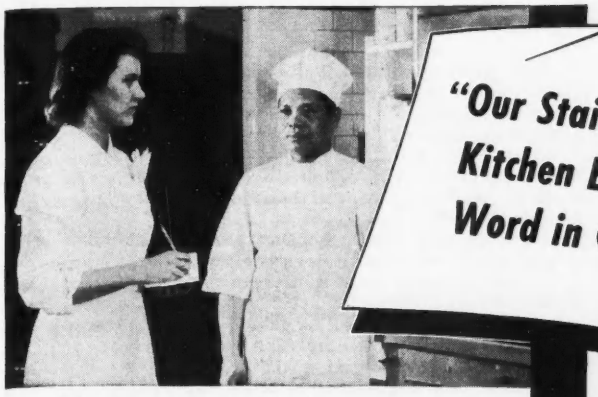
NUTRITION REVIEWS

Vol. 6, March, 1948

*Nutrition and ophthalmology. V. E. Kinsey.—p. 65.
A comparison of omnivorous and vegetarian diets.—p. 67.
*Nutrition studies with germ-free animals.—p. 83.

Vol. 6, April, 1948

*We need more nutritionists. W. H. Sebrell, Jr.—p. 97.
Diet and arteriosclerosis.—p. 99.
Reliability of nutrient calculations from food tables.—p. 120.
*Oral use of protein hydrolysates.—p. 122.



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Vol. 6, May, 1948
*Diet from the viewpoint of the obstetrician. W. J. Dieckmann.—p. 129.
Present knowledge of pteroylglutamates ("folic acid").—p. 131.
Vitamin contents and changes occurring in food plants.—p. 135.
*Goiter on an iodine free diet.—p. 158.

Vol. 6, June, 1948
Surgical nutrition. F. D. Moore.—p. 161.
*Effect of mineral oil on the absorption of carotene and vitamin A in man.—p. 170.

Vol. 6, July, 1948
*Nutrition and hematology. C. V. Moore.—p. 193.
*Factors affecting resistance of teeth to decay.—p. 196.
Biological synthesis of proteins.—p. 198.
Dietary fat and the genesis of experimental hepatomas.—p. 217.

Nutrition and Ophthalmology. The role of nutrition in ophthalmology is presented from the point of view of both the nutritionist and the ophthalmologist. By illustrating the visual process, the author points out how normal vision has been associated with certain specific nutrients such as riboflavin, tryptophan, lysine, methionine, vitamin A, and thiamine. In the light of these illustrations nutrition can be considered important in relation to ophthalmology. On the other hand, a questionnaire sent to twenty-seven ophthalmologists in Boston, Massachusetts, indicated that only 0.1 to 0.2 per cent of the ocular disorders observed in patients during a one-year period seemed to be related to diet. These findings suggest that frank nutritional deficiencies in the eastern area of the U. S. are relatively rare. This is in contrast to the situation in other parts of the world where eye diseases of apparent nutritional origin are found. Additional experimentation by both the nutritionist and the ophthalmologist would help to solve the problem of ocular disorders.

Nutrition and Germ-Free Animals. A review is presented of various methods which have been used to produce germ-free animals. It is pointed out that germ-free animals exist on a unique biologic level and should be considered as new experimental material which must be studied at length before it can be properly used. Nutrition studies in which the use of germ-free animals might provide the basis for significant information are as follows: (a) determination of animal nutritional requirements and animal metabolism in general; (b) studies of immunity and resistance to infection; (c) nutrition in relation to aging; and (d) the etiology of diseases for which the infectious agents are not well known.

Need for Nutritionists. The allocation of food is a most critical issue today in both foreign and domestic affairs. If we are to meet our obligations at home and abroad, we must decrease food wastage, apply nutrition knowledge in order to attain maximum health on minimum diets, and work out adequate distribution of food to meet the health needs of everyone. Much of the responsibility of carrying out such a program falls to the nutritionist. Her influence has been seen in such places as the school and the industrial lunch programs. Because of the increasing emphasis on the importance of nutrition education in health department programs, the nutritionist has been given an even greater avenue of influence. In this connection, the aims of the U. S. Public Health Service field investigation and demonstration units, in which the nutritionist is part of a team, are discussed. In conclusion it is pointed out that the great amount of money being alloted to the study of nutrition, and the current emphasis on the world food problem are tangible evidence that nutrition research is a most promising field to enter.

Oral Use of Protein Hydrolysates. Studies are cited which outline the indications for oral use of protein hydrolysates. It is emphasized that there is little reason to prefer hydrolyzed to native protein in the presence of normal gastrointestinal function. Oral protein hydrolysates have been found to be of value, however, in cases of chronic pancreatitis, post-operative resection of the head of the pancreas, ulcerative colitis, and some cases with intestinal short-circuits following surgery. Unfortunately, data showing the greater effectiveness of hydrolysates over whole protein in these conditions are almost nonexistent in medical literature; therefore, further clinical investigations of these problems, with appropriate control studies, are badly needed, especially in view of the wide use of oral protein hydrolysates.

The Obstetrician's View of Diet. There is a difference of opinion as to what constitutes a good diet. For this reason, the problem of the diet during pregnancy is of tremendous importance and demands further study. In a thought provoking discussion the author points out that there is no scientific proof that the pregnant woman need gain more weight than the combined weight of fetus, placenta, amniotic fluid, term uterus and breast, and increase in blood volume. If the recommendations made by the National Research Council for the diet of normal pregnant women are used, the caloric intake may be too high for many patients. A table is included in the article which compares the recommendations of the National Research Council with the diet used at the Chicago Lying-In Hospital for normal pregnant, obese, and pre-eclamptic patients. The Chicago diet is lower in calories and varies somewhat from the National Research Council recommendations in respect to calcium, iron, vitamin A, thiamine, riboflavin, niacin, and ascorbic acid. Investigations being carried on at Chicago Lying-In Hospital are described and the place of the nutritionist as a member of the prenatal team is emphasized.

Iodine-Free Diet. An investigation is mentioned in which the conclusion was reached that endemic goiter is not due to a lack of iodine. Another report is cited in which rats were fed an iodine-free diet. The thyroid glands of these rats were removed after a period of seventy-three days and were found to weigh approximately 40 mg. per 100 gm. of body weight. Rats fed the same diet supplemented with water containing iodine had normal thyroids weighing 10 mg. per 100 gm. of body weight. The conclusion was drawn that goiter is produced primarily by a lack of iodine.

Mineral Oil, Carotene, and Vitamin A. Several studies are described in which the effect of mineral oil on the absorption of carotene and vitamin A in man was observed. The data obtained are confusing; therefore, reference is made to a more recent investigation in which five healthy male subjects were studied over a period of fourteen months. The following observations were made: (a) There was no indication that taking mineral oil at bedtime caused the concentration of vitamin A in the plasma to become abnormally low. (b) Some precaution should be exercised in the amount of mineral oil prescribed for man if the vitamin A or carotene intake is low, or if carotene is the chief source of vitamin A in the diet. (c) If the vitamin A or carotene intake is low, a vegetable mucilloid would be the laxative of choice. In view of these observations, the question is raised as to whether mineral oil can be used safely for long periods of time without some interference with nutrition.

Nutrition and Hematology. For nearly three decades there has been a constant stream of contributions analyzing both the nutritional requirements for normal blood formation and the nutritional disturbances underlying some of the blood dyscrasias. Experiments are cited in which the nutritional approach to hematologic problems has been used. Nutritional factors are discussed in relation to such problems as macrocytic anemias, iron metabolism, leucocyte metabolism, and the coagulation mechanism. It is evident that the sciences of hematology and nutrition have been interdependent.

Resistance to Tooth Decay. During the war observations were made on reductions in the susceptibility of Norwegian and English children to tooth decay. These data served mainly to indicate the need for further study of the wartime caries reduction. Such a study has been made by

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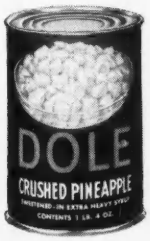

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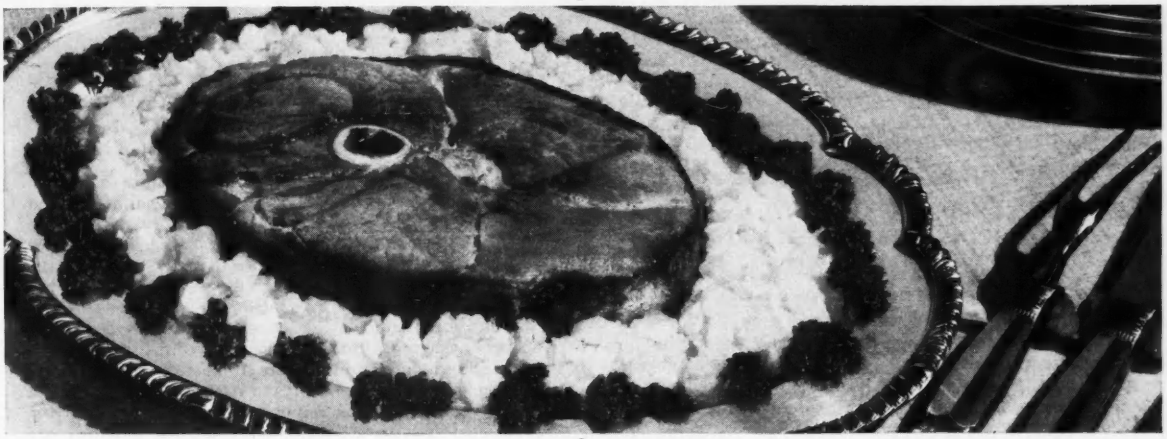

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Baked Ham Slice with a pineapple lei! Just sear an inch-thick slice of ham on both sides, then bake slowly until done. Place on hot platter and encircle the ham with drained Dole Crushed heated in a little of the ham fat.

TRICK No. 2

Fruit Cup. Combine equal parts of Dole Crushed Pineapple, berries, melon balls and seedless grapes. Other available fresh fruits can be used in place of the melons or grapes. Pour a little chilled ginger ale over all and top with sprigs of mint.

TRICK No. 3

Autumn Gelatin Mold. Make a lemon gelatin. When it begins to thicken, fold in plenty of the new crisp-cut Dole Crushed (drained), plus diced celery, red apples, sweet pickles, and walnuts as you like. Chill until firm. Serve on lettuce with mayonnaise or a creamy dressing.

TRICK No. 4

Upside-Down Cake. Use your regular recipe but drain the Crushed first before spreading it in the pan over the melted butter and brown sugar. A delicious variation of the old favorite — more pineapple per square inch and the tender glazed surface is so easy to cut.

TRICK No. 5

Pineapple-Gold Ice Cream. On top of snowy mounds of vanilla or coconut ice cream, heap spoonfuls of the new Dole Crushed. That's all there is to it—except to marvel at each taste of this delicious combination.

TRICK No. 6

Pine-Apple-Sauce. Perk up the flavor of apple sauce by adding to it the new Dole Crushed — an equal amount or less to suit your taste. Heat thoroughly and stir in a small lump of butter. A very nice accompaniment — hot or cold — for roast pork or sausage.

R. F. Sognnaes who based his clinical analysis of certain well established trends in dental caries incidence upon the dental caries experience of about 800,000 European children surveyed by various investigators in eleven countries. From the data obtained, it was demonstrated that there is an interval of several years between drastic reductions in availability of sucrose and other refined carbohydrate foods and the attainment of the maximum reduction in dental caries incidence. This observation indicates that there is a favorable effect of diet during tooth development on the resistance of teeth to decay. Animal studies also showed that resistance to tooth decay can be influenced by the diet consumed during tooth development.

SCIENCE

Vol. 108, July 9, 1948

*The importance of the time element in feeding of growing rats: experiments with delayed supplementation of protein. E. Geiger.—p. 42.

Delayed Supplementation of Protein. Experiments are reported in which it was shown that the growth rate of the infantile rat is affected by separation in the time of feeding of protein from the feeding of the remainder of the diet. Further investigation is being planned in order to determine whether simultaneous feeding of carbohydrates, fats, vitamins, or salts with the protein is necessary to achieve optimal growth.

AMERICAN RESTAURANT MAGAZINE

Vol. 32, June, 1948

*Controlling a restaurant's food costs. J. E. McNamara.—p. 45.
*Here is a layout pattern for a multiple service unit. G. Zipfel.—p. 66.

Food Cost Control. Food control is cost accounting applied to the production methods peculiar to the restaurant. Its purpose is to help the operator obtain the highest possible gross profit compatible with such established standards as quality, menu prices, and portion sizes. Food control involves much more than compilation of reports. It includes control of the merchandise from the time it is received until it is sold. With this thought in mind, the author discusses control in buying and receiving, storage, menu planning, and production.

Multiple Service Unit. It is often necessary to supply service to several units from one kitchen. A layout pattern is illustrated in which the serving units comprise a dining room, oyster bar, cocktail lounge, and a lunchroom. A great deal of flexibility is possible, as one of the several serving units can be closed off without interfering with the operation of the other units.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 4, May, 1948

*Double trouble, or too many kitchens. H. D. Henry and D. C. Osterheld.—p. 22.

Vol. 4, June, 1948

Remodeled for home ec. M. F. Smith.—p. 15.
Five steps to effective food buying. A. A. Frooman.—p. 19.
*Plastics put in their bid for table use.—p. 22.

Too Many Kitchens. An example of one of the food service problems of colleges today is that of getting additional feeding facilities. At the University of Wisconsin a gift from the federal government took the shape of a cafeteria seating 350 persons. Many difficulties were encountered in establishing efficient food service, because the equipment was difficult to obtain. Although the parent union building was located 1 mi. away from the new unit, a plan was devised whereby all food was prepared in the central kitchen and taken by truck to the new unit. Nine to eleven less employees were required than if the new unit had operated its own kitchen. The equipment peculiar to this type of food service is described and operating problems are taken into consideration.

Plastic Dishes. One university sent samples of a superior quality plastic ware to an industrial research laboratory for testing. The plastic was of the general class known as melamine-formaldehyde asbestos filled type, or urea-formaldehyde, or casein type. Tests were made for hardness, impact strength, and resistance to wear, water, heat, washing, dry heat (as in a warming oven), solvents, steam, and cigarette burns. Although the plastic ware did not stand up well when exposed to certain oils or when placed near a hot stovepipe or grill, most tests were very satisfactory. It was concluded that this particular plastic ware would be a favorable investment, compared with china dishes.

FOOD INDUSTRIES

Vol. 20, July, 1948

What glutamate does in food. S. E. Cairncross and L. B. Sjostrom.—p. 76.
*Pre-peeled potatoes from mechanized line. C. R. Havighorst.—p. 93.
*Versatile new packaging film. R. Signer and F. W. Tauber.—p. 96.
*Report on progress in fats and oils field. G. W. McBride.—p. 109.
Fluorescent lighting pays in meat sales cooler.—p. 113.

Pre-Peeled Potatoes. To provide restaurants with potatoes at savings in space, labor, and product, a mechanized production line has been developed which peels the tubers and treats them to prevent discoloration. Available in 60 lb. sacks, the potatoes sell for the same price as 100 lb. sacks of unpeeled potatoes. Under proper refrigeration and humidity control, they may be held from five to ten days. Procedures used in preparing the new product are described.

New Packaging Film. A new packaging film has been developed. It is a modified vinyl plastic product which has a degree of toughness, clings to irregularly shaped foods, and has a selective permeability to gases. It has no plasticizer to contaminate food it contacts. Figures on such properties as tensile strength, tear resistance, and moisture-vapor transmission are included in the article.

Fats and Oils. Scientific advances in the processing of fats and oils have already resulted in more economical manufacture of products featuring improved qualities. The outlook for supplies is about the same in 1948 as it was in 1947, with some decline in lard and soybean oil supplies but with increased supplies of cottonseed oil and coconut oil. Prices of fats and oils, in general, will remain high. Considerable attention is given in this report to the use of fats and oils in foods and to technologic improvements in the processing and marketing of fats and oils.

HOTEL MANAGEMENT

Vol. 66, July, 1948

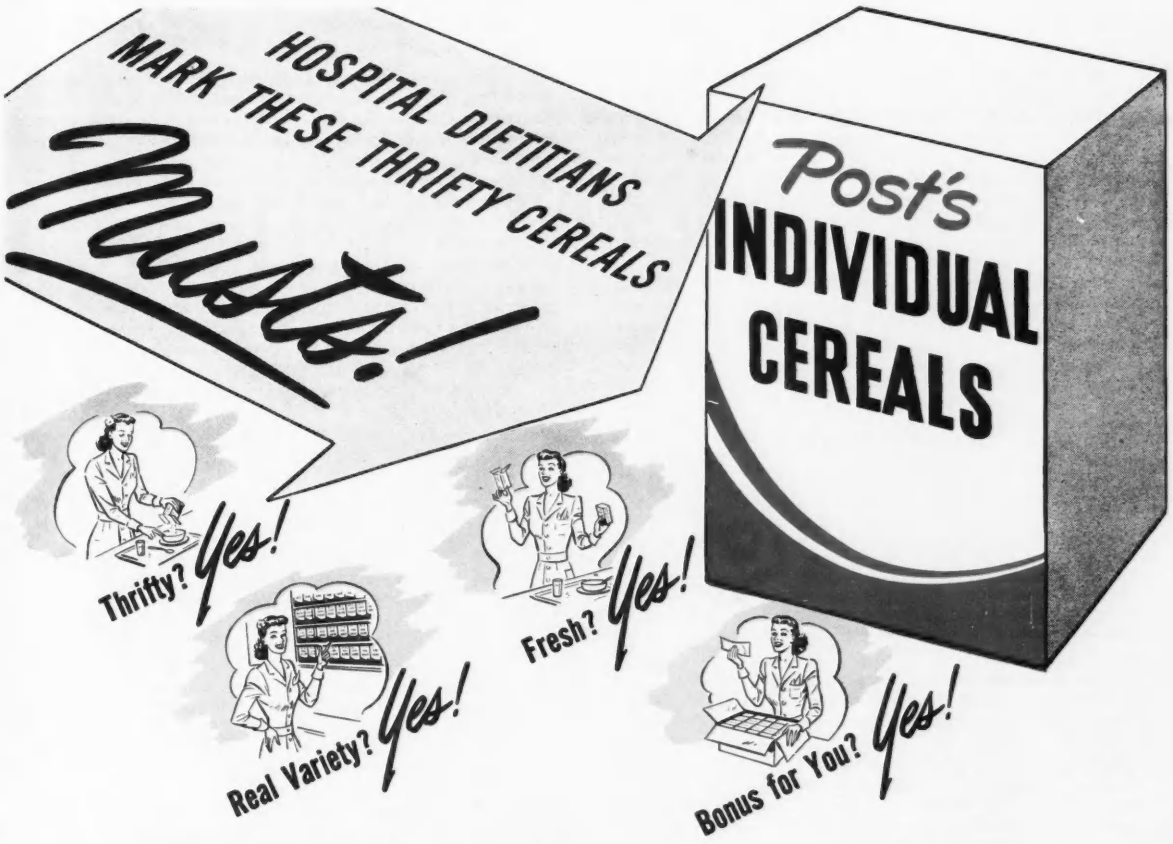
Five steps to effective institutional food buying. A. A. Frooman.—p. 98.
*Some recipes for the hospital dietitian's notebook.—p. 110.

Recipes for Hospital Food Service. Seven interesting recipes, most of them in quantities to serve 100 people, are presented. Recipes are given for the following: (a) prunes cooked in pineapple juice, (b) prune grapefruit salad, (c) raisin honey bread pudding, (d) pickel scramble, (e) Spanich rice, (f) pickle cole slaw, and (g) cottage dill tomato.

HOSPITALS

Vol. 22, June, 1948

*Some administrative problems of future food service. M. Gillam.—p. 66.
*An inexpensive, effective pre-rinse apparatus.—p. 74.
Insect control.—p. 74.



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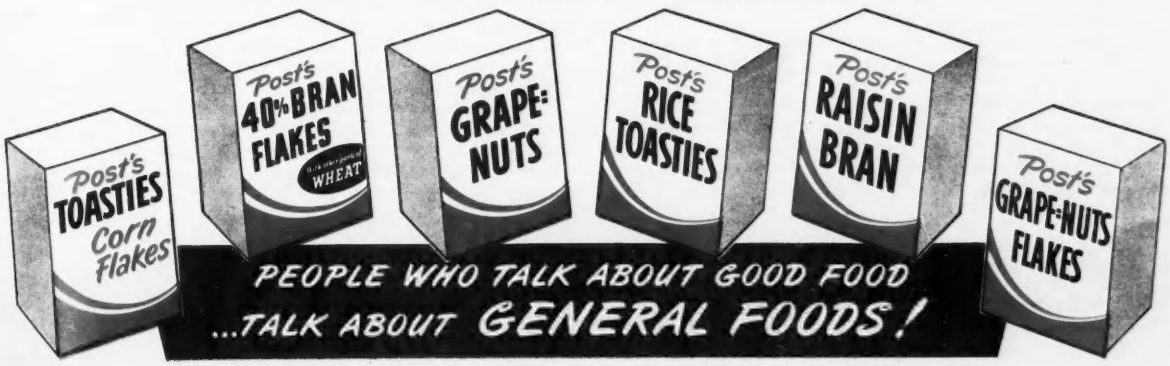

Administrative Problems of Future Food Service. There is considerable speculation about the future of hospital dietary department administration. New concepts of management, new buildings, new floor plans, and new types of equipment already are influencing the function and organization of the department. This article includes ideas on construction, questions for appraisal of existing dietary departments, discussion of employees' training programs and orientation, and predictions for the dietary department of the future.

Prerinse Apparatus. Although some of the new dishwashing machines being marketed are equipped with a prerinse tank, it is possible to construct an inexpensive and effective piece of equipment to use with the present dishwashing apparatus. Such a prerinse tank, used at the Toronto (Ontario) General Hospital, is described here.

INSTITUTIONS

Vol. 22, June, 1948

*Wall washing study finds new techniques.—p. 1.
Develop plan now to stretch coming year's fuel supply.—p. 2.
Air recovery saves money by reducing total cooling load. W. C. Heyer.—p. 14.
*Service was not interrupted while kitchen was enlarged.—p. 28.
*Only well trained waitress can give top-notch service. K. Duffy.—p. 29.
*Study job requirements to appraise supervisory skill.—p. 67.
*Employee-employer teamwork essential in sanitation success. W. H. Haskell.—p. 75.

Wall Washing. A research program concerned with improved and preferable wall washing techniques was recently completed by a middle western firm. In order to determine the best cleaning materials, equipment, and methods, a study was made in which 18,000 sq. ft. of wall surface, including painted metal, smooth painted brick, smooth painted concrete, painted plaster, stippled plaster, and glazed tile were washed. As a result, specifications for cleaning materials and equipment were developed. These specifications are given and methods of cleaning the various types of walls are described.

Hospital Kitchen Enlarged. Mercy Hospital, Charlotte, North Carolina, winner of an Award of Merit in *Institutions Magazine* second annual food service contest, enlarged their food service facilities without disrupting the existing set-up for preparing and serving meals. The new layout incorporates part of the area occupied by the original kitchen. The floor area was increased 250 per cent. Large, full-paned windows along the outer wall were separated by glass brick partitions, giving a maximum amount of sunlight. The cooking area is lighted by fluorescent tubes. A ventilating system introduces fresh air into the various departments, and at the same time removes steam and odors. All equipment in the kitchen except the gas ranges, deep fryers, and broiler is of stainless metal. All supplies are received through the doors adjacent to the refrigerators. Vegetable and meat preparation areas are near the storage area. Other details of equipment and layout are described, and floor plans are given. Approximately 35,000 meals are served each month by seventeen employees.

Well Trained Waitresses. This article, the fifth in a series, gives pointers for the waitress in serving the customer and in satisfactorily carrying out her duties. The qualities of a good waitress are considered and photographs are included to illustrate what the good waitress does not do.

Supervisory Skill. In meeting the problems which arise in training courses for supervisors, it has been found that it is necessary to analyze the job requirements, and then to analyze the characteristics of the individual and his ability to handle the job. Since most personality and aptitude tests are aimed at discovering aptitudes and abilities previous to either training or employment, self-analysis is more valuable than formal tests in determining how well a supervisor measures up to the requirements of his job. The purpose of the self-analysis is diagnostic rather than critical. A supervisor's self-analysis rating sheet is given.

Teamwork in Sanitation. The most essential factor in proper operation of eating and drinking establishments is a realization of the absolute necessity for teamwork between the operator and his employees. The attitude of the employee must be right or there can be no successful sanitation program. Owners and operators, in too many instances, are solely at fault for an unhealthy employee attitude. The morale of the worker must be raised by convincing him that his job is essential. Time must be taken to train workers in the importance of attractive service, immaculate appearance, and above all, pride in a job well done. The establishment of food handler training facilities in every local area in the U. S. large enough to support them would do much to further food sanitation practices.

THE MODERN HOSPITAL

Vol. 70, June, 1948

*Ingredients for safe formulas. F. M. Gipe.—p. 53.
*A guidebook gets them off to a good start. N. O. Lindley.—p. 70.
*Visual aids to inservice training. H. Cahill.—p. 96.
*The quality of service comes back to good administration. A. W. Eckert.—p. 97.

Formula Room Management. The author presents reasons for one plan of management of the formula room. In this plan the directing head is a graduate registered nurse, well informed in the field of microbiology and skillful in surgical technique; she should be as competent as the operating room nurse. A dietitian should act as consultant. In explaining this arrangement, it is pointed out that although both the nurse and the dietitian have had the academic training which prepares them for supervision of a formula room, the nurse has the advantage of a longer period of practice in aseptic principles due to her experience in the operating room. A general idea is given of the routine followed in the formula room under the above arrangement.

Guidebook for New Employees. Progressive personnel relations depend a great deal upon the way in which new employees approach their jobs. A guidebook, properly written, can be most helpful in giving these employees the right impression. Such a guidebook should answer these five basic questions: (a) What kind of place is a hospital? (b) Who owns the hospital? (c) What do I get besides my pay check? (d) Is my job secure? and (e) Will my talents and loyalty be recognized? These questions are elaborated upon in the discussion.

Visual Aids and Employee Training. The training program for dietetic personnel in the Veterans Administration considers teaching by use of audio-visual aids most important. Description is given of the training of food service workers in the dietetic section of the V. A. Medical Service Branch Office No. 12, San Francisco, California.

Good Administration in the Dietary Department. The author, an administrator, stresses the need for well qualified dietitians as heads of hospital dietary departments. Cooperation between the administrator and the head of the dietary department is most important if the department is to function efficiently. A plan of organization for the dietary department is suggested, and a number of common problems are considered. Attention is given to the relationship of the dietetic staff to the nurses, the housekeeping department, and to the doctors. Matters in which the administrator can and should support the dietary department are discussed.

CHIQUITA BANANA SAYS:

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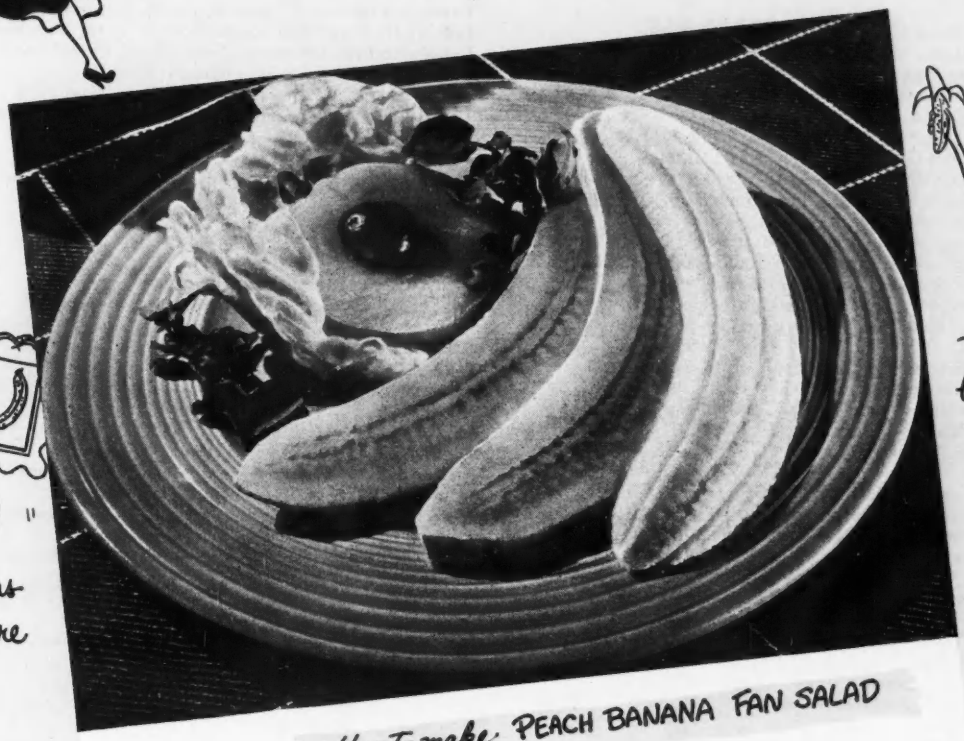

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How to make PEACH BANANA FAN SALAD

(1 Large individual serving)

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Lettuce
Berry or cherry
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Watercress or parsley

Place peach half into a crisp lettuce leaf and arrange at back of salad plate. Garnish with berry. Peel and cut banana lengthwise into 3 slices and place across front of salad plate. Spread slices open to resemble a fan. Garnish with crisp watercress or parsley.

Serve with a sweet or tart dressing.

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American Can Company, New York, New York
American Dry Milk Institute, Chicago, Illinois
American Institute of Baking, Chicago, Illinois
American Machine & Foundry Company, New York, New York
American Stove Company, Cleveland, Ohio
Angelica Jacket Company, St. Louis, Missouri
The Anstice Company, Inc., Rochester, New York
Armour & Company, Chicago, Illinois
The Best Foods, Inc., New York, New York
Biro Manufacturing Company, Marblehead, Ohio
G. S. Blakeslee & Company, Chicago, Illinois
S. Blickman, Inc., Weehawken, New Jersey
G. S. Blodgett Company, Inc., Burlington, Vermont
Borden Company, New York, New York
Calgon, Inc., Pittsburgh, Pennsylvania
California Fruit Growers Exchange, Los Angeles, California
Carnation Company, Oconomowoc, Wisconsin
Cereal Institute, Inc., Chicago, Illinois
Champion Dish Washing Machine Company, Erie, Pennsylvania
Chicago Dietetic Supply House, Inc., Chicago, Illinois
Cleveland Range Company, Cleveland, Ohio
Colt's Manufacturing Company, Hartford, Connecticut
Cream of Wheat Corporation, Minneapolis, Minnesota
Cube Steak Machine Company, Needham Heights, Massachusetts
C. E. Dennis, Martinsburg, West Virginia
Detroit-Michigan Stove Company, Detroit, Michigan
The Dietene Company, Minneapolis, Minnesota
Edward Don & Company, Chicago, Illinois
Doughnut Corporation of America, New York, New York
DuBois Company, Cincinnati, Ohio
Duke Manufacturing Company, St. Louis, Missouri
Dwinell-Wright Company, Boston, Massachusetts
Evaporated Milk Association, Chicago, Illinois
M. M. Faust Company, Boston, Massachusetts
Filtrator Coffee Apparatus Company, Inc., New York, New York
Florida Citrus Commission, Lakeland, Florida
Frigidaire Division, General Motors Corporation, Dayton, Ohio
General Foods Sales Division, General Foods Corporation, New York, New York
General Mills Inc., Minneapolis, Minnesota
Gerber Products Company, Fremont, Michigan
G. Giovino Company, Boston, Massachusetts
Grocery Store Products Sales Company, Inc., New York, New York
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H. J. Heinz Company, Pittsburgh, Pennsylvania
Hilker & Bletsch Company, Chicago, Illinois
Hobart Manufacturing Company, Troy, Ohio
H. P. Hood & Sons, Boston, Massachusetts
Hotpoint, Inc., Chicago, Illinois
H. A. Hovey Company, Boston, Massachusetts
Institutions Magazine, Chicago, Illinois
International Minerals & Chemical Corporation, Chicago, Illinois
H. A. Johnson Company, Boston, Massachusetts
Johnson-Appleby Company, Cambridge, Massachusetts
Jones, McDuffee & Stratton Corporation, Boston, Massachusetts
Juice Industries, Inc., New York, New York
Junket Brand Foods, Little Falls, New York
Kellogg Company, Battle Creek, Michigan
Charles B. Knox Gelatine Company, Inc., Johnstown, New York
Kraft Foods Company, Chicago, Illinois
Landers, Frary and Clark, New Britain, Connecticut
Francis H. Leggett & Company, New York, New York
Legion Utensils Company, Long Island City, New York
Libby, McNeill & Libby, Chicago, Illinois
Lily-Tulip Cup Corporation, New York, New York
J. B. Lippincott Company, Philadelphia, Pennsylvania
Lyons-Alpha Products Company, Inc., New York, New York
McGraw Electric Company—Toastermaster Products Division, Elgin, Illinois
The Macmillan Company, New York, New York
Magikitch'n Equipment Corporation, Quakertown, Pennsylvania
The Maltex Company, Burlington, Vermont
Market Forge Company, Boston, Massachusetts
Massachusetts Cooperating Gas Companies (Boston Consolidated Gas Company), Boston, Massachusetts
Mayer China Company, Beaver Falls, Pennsylvania
Mead Johnson & Company, Evansville, Indiana
Metropolitan Wire Goods Corporation, Brooklyn, New York
C. V. Mosby Company, St. Louis, Missouri
National Association of Margarine Manufacturers, Washington, D. C.
National Cranberry Association, Hanson, Massachusetts
National Dairy Council, Chicago, Illinois
National Live Stock & Meat Board, Chicago, Illinois
The Nestle Company, Inc., New York, New York
The Paper Cup & Container Institute, New York, New York
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Pet Milk Sales Corporation, St. Louis, Missouri
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S. S. Pierce Company, Boston, Massachusetts
J. C. Pitman & Sons Sales Corporation, West Lynn, Massachusetts
Procter & Gamble Distributing Company, Cincinnati, Ohio
G. P. Putnam's Sons, New York, New York
Quaker Oats Company, Chicago, Illinois
Qualheim Inc., Racine, Wisconsin
Ralston Purina Company, St. Louis, Missouri
Raytheon Sales Corporation, Waltham, Massachusetts
Reid Murdoch & Company, Chicago, Illinois
Rich Products Corporation, Buffalo, New York
Roto-Cut Corporation, Cleveland, Ohio
Salvajor Company, Kansas City, Missouri
W. B. Saunders Company, Philadelphia, Pennsylvania
Savory Equipment, Inc., Newark, New Jersey
Sealtest Consumer Service, New York, New York
Ad. Seidel & Son Inc. Chicago, Illinois
John Sexton & Company, Chicago, Illinois
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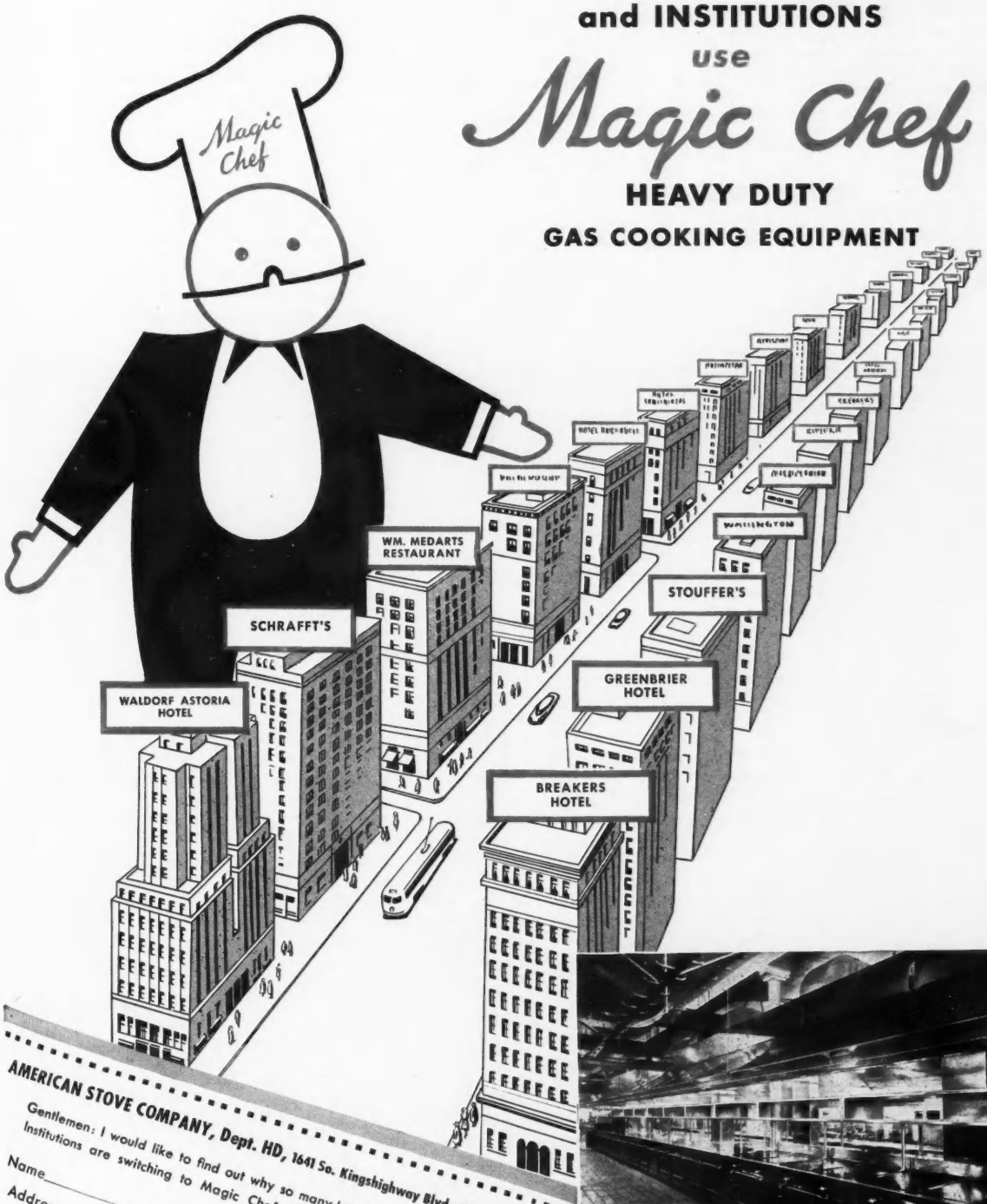

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Dietitians Serve During Flood Emergency in Oregon

Among the many volunteers who served with the American Red Cross in Portland, Oregon, during the emergency period following the Columbia River floods at Vanport City and the eastern section of Portland, were the local dietitians. Under the guidance of dietitians and dietetic interns, emergency feeding operations were organized in the mass shelters which were set up in twenty-four schools, churches, community centers, and the American Legion Hall. A typical situation was that found at the Woodlawn Church, where dietitians supervised neighborhood women in the preparation and serving of meals for Vanport evacuees. Since the church kitchen was small, only a small group of women worked at one time. The Red Cross supplied the evacuees with ample canned goods, as well as with perishable foods. After the dietitian had planned a nutritionally adequate menu for the day, the food was prepared and served by the neighborhood women.

In addition to feeding the evacuees, it was necessary to prepare food for the scores of volunteer men working to save important dikes in the eastern part of the county. The average food orders coming in through the night were for 200 and 300 lunches. Two types were prepared—hot and cold. The cold lunch was dispersed in the form of box lunches with two sandwiches, fresh fruit, cookies or doughnuts, coffee and milk, cigarettes, and candy. The hot lunch consisted of a hot casserole, such as chili, beef stew, or macaroni and cheese, with bread and butter sandwiches, fresh or canned fruit juice, cookies or doughnuts, coffee, and milk. It was often necessary to complete an order for 200 lunches in 15 or 20 min. After the food was prepared by volunteers who were supervised by a dietitian, serving equipment was provided and the entire order was transported by Red Cross motor service to its destination.

When it became necessary to register the thousands of families who were made homeless by the floods, Red Cross disaster headquarters were set up in the Public Auditorium. Due to the large crowds, it was necessary to wait some time to register. After one day, it became apparent that the long waiting period was hard on small babies and children, and it was also difficult for the parents. Consequently, a nursery was improvised for one week. Dietitians were called upon for work in the nursery and in the kiddies' canteen. Dietetic interns had the responsibility of helping make formulas. This was particularly difficult at first because few bottles were available and space and other equipment were limited. When the mothers could give the proper proportions for their babies' formulas, these were used. Otherwise, two general formulas, devised by the doctors, were used: the one, for babies six months old or younger, consisted of 1 part milk, 2 parts water, and 1 Tbsp. of Karo; the other, for babies over six months old, was made up of 1 part milk, 1 part water, and 1 tablespoonful of Karo. Canned baby foods were also given to the older babies. Some difficulty was encountered at first in getting the children to eat, as they were frightened and somewhat skeptical about the entire situation. However, with a little persuasion, the eating problems were overcome.

Another important place where dietitians gave expert aid was at the emergency Swan Island shelter, which housed families throughout most of the summer, or until they were able to find some kind of temporary housing. At this shelter, the dietitians took charge of planning adequate but economical menus. As a result many of the evacuees were eating adequate diets for the first time.

A situation such as that found in the Oregon flood brings with it the realization that there are a number of ways in which dietitians and nutritionists can and should cooperate with the Red Cross, which is the first organization turned to in time of emergency. The dietitians of Portland have suggested that dietetic groups in the various cities keep a file of persons who are trained in food service and administration and learn more about the disaster service and resources of the American Red Cross.—*From a report submitted to the Portland-Multnomah County Chapter of The American Red Cross by Betty Jones, President, Oregon Dietetic Association.*

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News Notes

A.A.A.S. Meeting on Nutrition. Of special interest to nutritionists and dietitians will be the Food and Nutrition Session of the A.A.A.S. annual meeting to be held in Washington September 13–17. Thursday morning, September 16, the Food and Nutrition Session will be held in the Departmental Auditorium. Professor Anton J. Carlson of the University of Chicago will preside. The speakers are: Professor William A. Albrecht, University of Missouri, who will speak on the subject, "Nutrition and the Climatic Condition of Soil Development;" Professor C. A. Elvehjem, University of Wisconsin, will speak on "Seven Decades of Nutrition Research;" and Dr. Margaret Mead, American Museum of Natural History, dealing with "Cultural Contexts of Nutritional Patterns." Discussants will be Dr. R. R. Williams and Dr. Elmer M. Nelson, Chief, Vitamin Division, Food and Drug Administration. A general description of the A.A.A.S. centennial anniversary appeared in the August issue of the JOURNAL.

WHO Approves Four Programs. The World Health Assembly which met in Geneva, Switzerland, in June and July has, on the recommendation of the program committee, granted priority to four programs in 1949. These are for combating malaria, tuberculosis, and venereal disease on a global scale, and for the improvement of maternal and child health. Selection was determined not only by the widespread need for action but also because international cooperation in these fields has been proved feasible. An advisory committee of experts will be established and to implement the program, each will be represented by a special section in the WHO secretariat. The committees will have permanent status.

Other programs were also approved for Assembly action. It has been proposed that a study be made of the problems of environmental sanitation in order to combat water-borne and milk-borne diseases. Programs were approved on housing and town planning, industrial hygiene, medical care, medical rehabilitation, and medical social work. Other programs to be acted upon in 1949 are public health administration, technical education, tropical and rural hygiene, alcoholism, drug addiction, and nutrition.

Preliminary returns on a survey being conducted by WHO on the world's demand for insulin and the possible supply indicated that there would be an ample supply if the pancreatic glands of slaughtered animals did not have to undergo refrigeration. In this connection, WHO is publishing a method by two German scientists by which the glands can be preserved without the usual refrigeration.

A recommendation has been made that WHO undertake a study of the cancer problem and that studies be continued in regard to rabies, trachoma, the hygiene of seafarers, and rheumatoid diseases. The program committee approved the establishment of a world influenza center which would be located in the National Institute for Medical Research, London. International centers were approved, too, for undulant fever and schistosomiasis (a parasitic disease found in tropical areas). A study of the need for establishing a WHO bureau to assist member countries in the purchasing of essential medical supplies and vital drugs and equipment will be submitted to the next World Health Assembly.

In addition to selecting Geneva, Switzerland, as the permanent headquarters for WHO, the Assembly recommended that regional offices be set up in the following areas: Eastern Mediterranean, Western Pacific, Southeast Asia, Europe, and Africa. The European headquarters, serving the war-ravaged countries, would be discontinued as soon as a satisfactory level of health had been reached. No regional office for the Americas was recommended because of negotiations to integrate the Pan American Sanitary Bureau with WHO.

American Chemical Society Meeting. The 114th national meeting of the American Chemical Society will be held in three sessions this year. The divided national meeting, first in the Society's seventy-two-year history, was arranged to enable the maximum number of the 57,000 members to attend. The Eastern Session was held in Washington, D. C. August 30 to September 3; the Midwest Session ran in St. Louis September 6 to 10; and the Western Session took place in Portland September 13 to 17.

Chemistry's latest contribution to alleviation of the world food shortage, to the improvement of agricultural techniques and products, and to the unceasing war on disease will be stressed at the Washington session. Three awards were presented at a general assembly on Monday night, August 30. The Francis P. Garvan Medal honoring women in chemistry was given to Dr. Gerty T. Cori of the Washington University School of Medicine, St. Louis, 1947 Nobel prize winner in medicine, for her work in biochemistry. The Eli Lilly & Company Prize in Biological Chemistry was presented to Dr. Dilworth Wayne Woolley, 33-year-old blind scientist of the Rockefeller Institute for Medical Research, New York, for studies of problems relating to vitamins and antivitamins. Dr. Albert L. Lehninger, Assistant Professor of Biochemistry in the University of Chicago's Department of Surgery and Biochemistry, received the Paul-Lewis Laboratories Award in enzyme chemistry for his research on the chemistry and metabolism of fatty acids.

One of the highlights of the Midwest Session in St. Louis was the presentation of America's top chemistry honor, the Priestley Medal, to Dr. Edward R. Weidlein, Director of the Mellon Institute for Industrial Research, Pittsburgh.

At the meeting in Portland, Oregon, recent achievements of the nuclear chemist in the field of atomic energy, of the biological chemist in animal nutrition, and of the wood chemist in deriving sugars from wood were stressed. A symposium on "Marine Products" was sponsored by the Division of Agricultural and Food Chemistry. Vitamin-bearing oils, fish meal, and practical uses for the waste of fisheries were discussed. The theme being presented by the Division of Biological Chemistry was that of animal metabolism and substances inhibiting growth. Another feature of the Portland session was the presentation of the Borden Award in the chemistry of milk, to Dr. B. L. Herrington, Professor of Dairy Chemistry at Cornell University.

Follow-up on National Health Assembly. Steps have been taken to continue the nation-wide cooperation stimulated by the National Health Assembly. The NHA steering committee has recommended organizing on a permanent voluntary basis to provide a vehicle for carrying out the recommendations made by the Assembly when it met early in May. Its objectives will include: making plans and stimulating activities to meet national, state, and community health needs; encouraging local initiative, interest, support, and participation of the entire community in assessing their own health needs, and in developing their own programs for action; cooperating with both government and non-government organizations on national, state, and local levels; and stimulating regional, state, and local health conferences, with the broadest possible representation and support of both lay and professional groups.

School Food Service Association. The School Food Service Association is to meet in Detroit at the Hotel Statler,

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Add ¼ teaspoon Ac'cent to ½ pint sauces and gravies.

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BROILED, FRIED & SAUTEED: Rub in ¼ teaspoon Ac'cent per ¾ lb. just before cooking or, preferably, 10 min. before to allow penetration.

POTTED MEATS, ROASTS, LOAVES & STEWS: Add ¼ teaspoon Ac'cent per lb. of meat before cooking.

BREADING FOR CHOPS, FISH, FOWL, ETC. Add 1 teaspoon Ac'cent per 4 oz. fine bread crumbs.

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VEGETABLES

FRESH, FROZEN, CANNED AND CREAMED: ASPARAGUS, BEETS, BROCCOLI, BRUSSELS SPROUTS, CABBAGE, CARROTS, CAULIFLOWER, CORN, LIMA BEANS, ONIONS, PARSNIPS, PEAS, STRING BEANS, ETC.
Add ¼ teaspoon Ac'cent per 8 oz. of vegetables before cooking. It is best to add Ac'cent to the sauce in creamed vegetables.

POTATOES: AU GRATIN, ESCALLOPED, CREAMED, HASH BROWNED, WHIPPED, ETC. Add ¼ teaspoon Ac'cent per ½ lb. Add Ac'cent at time of seasoning

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CREAMED DISHES

CHICKEN A LA KING, CREAMED TURKEY & MUSHROOMS, DEEP DISH CHICKEN POT PIE, CREAMED CODFISH, CREAMED SHRIMP, LOBSTER NEWBURG: Add ¼ teaspoon Ac'cent per 8 oz. serving.

FRICASSEE OF CHICKEN Add ¼ teaspoon Ac'cent per lb. of eviscerated chicken.

MACARONI AND CHEESE: Add ¼ teaspoon Ac'cent per 10 oz. serving.

In creamed dishes it is best to use Ac'cent in the sauce.

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November 18 to 20. The tentative program is as follows:

November 18 *Morning*

Demonstration: Quantity Preparation of Raised Rolls—Helen Tweedale, Cass High School
Trips to Schools, Commercial, and Industrial Food Service Operations
Round Table Discussions: Employee Training; Layout and Equipment; and Safety in the Kitchen

Afternoon

General Session: School Meals at the Crossroads—Mary deGarmo Bryan
Section Meetings:
School Lunch: Report on School Lunch Legislation—Katherine Harris; Federal School Lunch Programs—Margaret M. Morris; and Panel on Controlling Costs—Natalie Betts
College Food Service—Nell Morris, presiding
Industrial and Commercial Food Service—Carolyn K. Powell, presiding
Demonstration: How to Standardize a Recipe—Margery Trott, Wayne University Student Center.

Evening

General Session: Diet and Democracy—Dr. Jacob Meyer

November 19 *Morning*

Demonstration: Quantity Preparation of Simple Salads—Clara Shipp, Western High School Lunchroom
Round Table Discussions: State and county directors and supervisors, city directors and supervisors, and lunchroom managers

Afternoon

General Session
Is It Adequate—a home-made yardstick?—Dr. Dena Cederquist
The School Lunch in a Functional Program—Dr. Stuart A. Courtis
Round Table Discussions: Directors and supervisors; managers of lunchrooms over 1000; managers of lunchrooms of 250 to 750; teacher-managers; university and college residence halls directors; and industrial and commercial managers

Evening

Banquet: Impressions of India and China Today—Mary Sweeny

November 20 *Morning*

Round Table Discussions:
Nutrition Education—Mary Kavanaugh, presiding
Good Housekeeping—Edna Gilbert, presiding
Financing the School Lunch—Rodney Ashby, presiding
General Session
Menu Planning—Jane Porter
Merchandising—Florence Lehlam
Controlling Food Costs—Winifred Eliason
Luncheon: Women, Historical and Hysterical—Dr. Robert Drews

Alaska Health Projects. Arrangements have been made by the U. S. Government to build a 400-bed, $6,000,000 hospital at Anchorage, Alaska. Three-fourths of the beds will be for tuberculosis patients, the remainder for general medical and surgical patients. In the meantime, a field station has been established at Anchorage, intended to be the nucleus of a future Arctic Institute of Health.

Research on the Rice Diet. At Duke University, Dr. Walter Kempner has received a grant of $10,500 from the Life Insurance Medical Research Fund for research on the effect of diet on mineral metabolism in renal and hypertensive disease.

Food and Nutrition Research. A new publication has been released by the Food and Nutrition Board of the National Research Council. It is entitled *Survey of Food and Nutrition Research in the United States, 1947*, contains 306 pages, and is obtainable from the National Research Council for $1.00. The survey consists of a compilation of research pertaining to foods and nutrition in academic, governmental, and industrial laboratories. There are four sections in the book: Section I classifies research projects by subject; Section II lists the organizations conducting or supporting food and nutrition research; Section III is a list of professional personnel engaged in food and nutrition research; and Section IV contains a comprehensive subject index to food and nutrition research. The survey was made by The Committee on Survey of Food and Nutrition Research of the Food and Nutrition Board with the support of The Committee on Food Research of the Quartermaster Food and Container Institute for the Armed Forces.

Nutrition Teaching Aids. Food value charts, useful for teaching nutrition to lay persons, are available at cost from the Nutrition Association of Greater Cleveland, Room 1016, 1001 Huron Road, Cleveland 15, Ohio. Each set includes fifteen cards, 3½ in. by 6½ in., which illustrate by colored bars the comparative food value of milk and coffee, whole milk and skim milk, fish and meat, and other commonly used foods. Single sets are 30 cents; quantities of twenty-five or more are 25 cents a set. These charts were originally prepared for public health workers in Cleveland but are now available for general distribution.

New Periodical. The Academic Press, Inc., has announced the publication of a new yearly periodical, to be titled *Advances in Food Research*. Each volume will contain contributions covering human nutrition, food acceptance, public health, agriculture, and food technology. Many articles will be concerned with specific commodity problems and will generally deal with problems involving one or more of the following characteristics of foods: nutritive value, acceptability, utility, storage life, health hazards, and sanitary quality.

USDA Publication. A new booklet prepared by the Bureau of Human Nutrition and Home Economics of the USDA is *How Families Use Their Incomes*. Called Miscellaneous Publication No. 653, this booklet may be obtained from the Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. for 30 cents. Within its sixty-four pages are charts and tables showing trends of a decade in our American way of handling family resources. Expenditures for food, clothes, housing, medical care, and other needs and wants are analyzed at different income levels and by families of different sizes and age levels.

Dietetic Interns Graduate. On July 28, nine dietetic interns completed their training at *Cook County Hospital*, Chicago. Certificates and A.D.A. pins were presented by the course director, Millie E. Kalsem. The graduates were: Betty Jean Cottle, Brigham Young University; Cornelia De Boer, Rosary College; Barbara Lundgren, Mundelein College; Ruth Kotz, Michigan State College; Marie C. Matte, Michigan State College; Marilyn

Army Announcements Concerning Personnel

The following dietitian was appointed in the Officer Reserve Corps, Women's Medical Specialist Corps, Dietitian Subsection:

2nd Lt. Anna G. Wiegand, R-2529

The War Department has released the following official list of names of Medical Department Dietitians (not previously announced) who have been separated from service:

Lt. Colonel

Burns, Helen C., R-10000, 79 Andrews St., Lowell, Mass.

Captains

Dickinson, Elizabeth H., R-1347, 62 Lancaster Rd., West Hartford, Conn.
Messersmith, Luceil M., R-110, 1906 Market St., Logansport, Ind.
West, Gloria G., R-99, 2207 S. Dollison St., Springfield, Mo.

First Lieutenants

Ashford, Olive I., R-941, #1, Maple Ave., Antrim, N. H.
Cables, Grace M. C., R-1040, Ludell, Kans.
Cary, Lucille, R-323, 536 N. Mission Drive, San Gabriel, Calif.
Davis, Catherine D., R-2483, 218 Palmer Hill Rd., Riverside, Conn.
Hagaman, Mary H., R-2257, Cherry & Iron St., Marion, Va.
Hvidston, Ruth M., R-2402, Edmor Apartments, Fargo, N. Dak.
Lanou, Frances M., R-2446, 48 Brookes Ave., Burlington, Vt.
Liming, Barbara J., R-2462, 48 Ballard St., Newton Center, Mass.
Reimers, Eleanor R., R-1087, 83 Haverford St., Hamden, Conn.

Second Lieutenant

Nathan, Natalie R., R-2495, 5523 Bartlett St., Pittsburgh 17, Pa.

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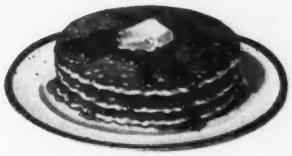
The time taken by food to pass completely through the stomach is often taken as a measure of digestibility. Judged by this criterion, a serving of Aunt Jemima pancakes, butter and syrup, plus coffee and cream is easily digested. Such a breakfast passes through the stomach more rapidly than ordinary pancakes and even faster than such a simple meal as orange juice, buttered toast and coffee. The doctors who discovered this were "amazed" until they found that the ingredients of Aunt Jemima pancakes are "so selected as to yield a mixture of low gluten content, which permits greater speed of solution and attack by the salivary amylase."



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MARY ALDEN, Test Kitchen, The Quaker Oats Company, Chicago 4, Illinois

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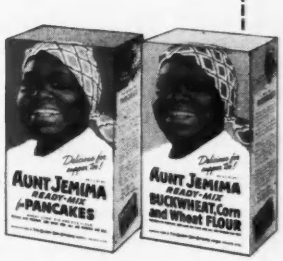

Noyes, Iowa State College; Marilyn Nye, Purdue University; Helen Schroeder, Michigan State College; and June Tanck, University of Illinois.

Seventeen dietetic interns were graduated from the course at *St. Mary's Hospital* in Rochester, the evening of July 8. Certificates and A.D.A. pins were presented by Dr. Russell M. Wilder to the following interns: Marian Bender; Ruth Bergstrom; Mildred R. Calvin; Dolores J. Chapman; Sister M. Claude, O.S.F.; Sister M. Clemenza, O.S.F.; Sister M. Cleophas, C.S.B.; Mary Goodell; Joan L. Hannon; Sister Mary Helen, O.S.F.; Anne V. Kramolowsky; Ellen E. Kurtz; Sister Lucy Mary, C.S.J.; Sister M. Moira, O.S.F.; Elizabeth H. Schlichte Elsie Vargo; and Sister M. Vitalia, O.S.F. In addition, an award was presented to Ruth Bergstrom as the outstanding member of the graduating class. Miss Bergstrom received a check to cover full expenses to the national convention of A.D.A. in Boston in October. Honorable mention was awarded to Sister Mary Helen and Sister Mary Moira.

On June 21, a tea was given at the *Stanford University Hospitals*, San Francisco, honoring the three interns completing training. Certificates were presented by Dr. Anthony J. J. Rourke, Physician Superintendent of the hospital. Helen Hawver Anderson, Director of Dietetics, presented the A.D.A. pins. The graduates were: Katherine Stanton, University of Georgia; Pattie Webb, Purdue University; and Marjorie Whitaker, Oregon State College.

At the *University of Kansas Medical Center*, Kansas City, four dietetic interns completed their year of postgraduate training July 31. They are: Mary Margaret Fennesy, St. Mary's College; Faye I. Hayes, Kansas State College; Dorothy Hopkins, Iowa State College; and Jo Ann Jorden, Kansas State College.

The *Veterans Administration Hospital* at Hines, Illinois, graduated their class of dietetic interns on July 9. Donetta Cox, Acting Chief Dietitian, presented the certificates, and Bonnie F. Beilfuss, Instructor in Dietetics, gave each intern her cap and A.D.A. pin. The graduates were: Mary AuBuchon, Rosemarie Brost, Mary Jane Clements, Mary Virginia Garland, Lois Good, Beverly Hallback, Irene Hogan, Lucile Holman, Margaret Kolze, Mary Kraemer, Mary Jane Lang, Evelyn Lindberg, Virginia Magliolo, Virginia Maiers, Lucille Nanfelt, Donna Rising, and Beatrice Wanta.

New Red Cross Director. Pauline Murrah has been appointed the new national Director of American Red Cross Nutrition Service. Miss Murrah, who is an A.D.A. member, was formerly the Nutrition Director of the North Atlantic Area of the Red Cross. Her previous experience includes positions as Nutrition Director for the Los Angeles and New York Chapters.

New Canadian Dietetic Association Officers. At their annual meeting in June, the members of the Canadian Dietetic Association elected officers for 1948–49. They are as follows: Honorary President, Violet M. Ryley of T. Eaton Co. Ltd., Toronto, Ontario; Honorary Vice-President, Marjorie Bell of Halifax, Nova Scotia; President, Kathleen Jeffs of T. Eaton Co. Ltd., Montreal, Quebec; President-Elect, Margaret Clark of the Royal Canadian Air Force, Ottawa, Ontario; Vice-President, Helen Farrell, Montreal, Quebec; Secretary, Dorothy Shantz of Robin Hood Flour Mills Ltd., Montreal, Quebec; and Treasurer, Elsie Watt, Anne de Bellevue, Quebec.

Home Economics at Pennsylvania State College. Next January a School of Home Economics will be established at Pennsylvania State College. It will be the ninth school on the campus and the first to be organized since 1930. There are now 375 students at the college majoring in home economics.

Library Material. A publication of the Veterans Administration Hospital, Hines, Illinois, has been added to the A.D.A. Library and is available for loan to members. It is a *Class Instruction Manual in Nutrition and Diet Therapy for Dietetic Department Employees.*

Consumer Booklet on Babies. Public Health Affairs Pamphlet No. 141, is titled *Enjoy Your Child—Ages 1, 2, and 3.* The section on feeding includes a discussion on the implements for the young child, the atmosphere of meal times, and the problem of helping children to feed themselves. The booklet may be obtained from the Public Affairs Committee, 22 E. 38th St., New York 16, for 20 cents.

Academy of Restaurateurs. Students of the restaurant management course at Ohio State University have formed the Academy of Restaurateurs. All university or college students participating in any type of restaurant management curricula will be eligible for membership.

The purpose of this organization is to foster professional standards, to help members to know each other, and to promote an interest in restaurant management among college students and a closer association between the students and persons already engaged in the restaurant industry. The organization was initiated by the Ohio State Restaurant Association and students are considered student members of the Association.

New Uses of Waste from Food Processing. Research at the Western Regional Laboratory of the Department of Agriculture indicates that waste from canneries and other food processing plants may be used to make concentrated feed for poultry and other livestock or for producing antibiotics. Waste from the canning of pears, it has been found, is suitable for growing yeast with high protein and vitamin content which can be used as a concentrate and mixed with other products as part of the feed ration for poultry. Waste from canning pears amounts to almost 100,000 tons a year, and it is estimated that if half of this quantity were used in the manufacture of yeast, it would produce about 1500 tons of the concentrated feed and have a value of more than $250,000 annually.

Processing plants also discard over 70,000 tons of asparagus butts annually. Research has now developed a practical process for producing asparagus juice from this waste and for concentrating it for convenience in storage and handling. This juice has proved to be a good medium for growing a number of microorganisms, including *Bacillus subtilis*, which produces the newly identified antibiotic, subtilin.

How to Peel Hard Cooked Eggs. The following directions for peeling hard-cooked eggs have been prepared by the Department of Agriculture:

As soon as the egg is cooked, cool it immediately under running water to loosen the shell, prevent overcooking and a dark ring around the yolk, and make handling easier. Crack the shell by tapping against a hard edge or with a spoon. Then loosen it by rolling the eggs between the hands. Hold the egg under water and begin peeling at the large end where there is an air space. The cold

New Appointments, Veterans Administration

The following hospital appointments of dietitians (not previously announced) have been made by the Veterans Administration

Name	Position	Location
	Branch No. 5	
Elizabeth Hope Bason	Staff Dietitian	Nashville, Tenn.
Marylila Bibb	Staff Dietitian	Lake City, Fla.
Dorothy Bolus	Staff Dietitian	Murfreesboro, Tenn.
Mary Caroline Bradley	Staff Dietitian	Columbia, S. C.
Elizabeth G. Clark	Staff Dietitian	Columbia, S. C.
Eleanor I. Thompson	Staff Dietitian	Columbia, S. C.
Bernice Steele	Staff Dietitian	Tuscaloosa, Ala.
Sarah C. Stulb	Staff Dietitian	Chamblee, Ga.
Edith Wagoner	Staff Dietitian	Memphis, Tenn.
	Branch No. 6	
Dorothy H. Jett	Staff Dietitian	Dayton, Ohio
	Branch No. 9	
Shirley Pales	Staff Dietitian	Fayetteville, Ark.
	Branch No. 10	
Ardith A. Kephart	Staff Dietitian	Dallas, Tex.
Hazal Eve Mouton	Staff Dietitian	Alexandria, La.
Jean D. Springer	Staff Dietitian	New Orleans, La.
	Branch No. 12	
Virginia Holliday	Staff Dietitian	Los Angeles, Calif.
Beatrice Nathanson	Staff Dietitian	Los Angeles, Calif.
Blanche Helen Parker	Staff Dietitian	Reno, Nev.

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water helps ease off the shell and washes away any bits left on the white.

Food Supplies. The following foods are expected to be plentiful in September, according to the Production and Marketing Administration of the Department of Agriculture:

Fresh produce and fruits

Apples	Oranges
Celery	Potatoes, Irish
Grapes	Tomatoes
Lemons	

Canned foods

Apple juice	Peanut butter
Apples	Peas
Apple sauce	Prunes (purple plums)
Fruit spreads	Tomato catsup
Grapefruit segments	Tomato juice
Honey	Tomato paste
Orange and grapefruit juice, blended	Tomato purée

Miscellaneous foods

Eggs
Fish, fresh and frozen
Pecans

News of State Associations

California Dietetic Association. The *Bay Area Section* of the California Dietetic Association met at the St. Francis Hospital in San Francisco on May 11 to hear an address on "Public Relations for Women" by Madonna Todd, Public Relations and Advertising Director for the B & T Advertising Service and Educational Director for radio station KQW.

The annual meeting of the year, a picnic, was held on June 15 at the Herrick Memorial Hospital, Berkeley. At this meeting the election of officers for the coming year took place. The results were as follows: Chairman, Mary Verkuyl, Community Hospital, San Mateo; Vice-Chairman, Margaret Rosenmeier, Veterans Administration, San Francisco; and Secretary-Treasurer, Virginia Stockdyk, University of California Hospital, San Francisco.

The April meeting of the *Los Angeles Section* was held in conjunction with the Home Economics Association on Saturday morning, April 17, at the Southern California Gas Company. The topic of the day was "Careers in Home Economics." A home economics teacher, a dietitian, a home economist in business, and a homemaker were introduced to the group. Each gave a short talk on the opportunities and types of work in her particular field. A clever two-act skit entitled, "How Not to Interview for a Position" was presented by members of the Home Economics Association. Several schools exhibited material to illustrate the variety of careers open to girls interested in home economics.

On May 10 a meeting was held at the Methodist Hospital, Los Angeles. Dr. Joseph Pessin, Director of Professional Education at the Brentwood Hospital, Veterans Administration Center, Los Angeles, addressed the group on "Nutrition and Psychiatry."

Officers for the coming year are: Chairman, Grace Stumpf; Vice-Chairman, Lillian Emoff; and Secretary-Treasurer, Florence McGucken.

The *San Diego Section* held its April meeting at the Nurses' Home, Scripps Metabolic Clinic. Helen B. Anderson, assisted by several other members, presented a paper on dental caries. The May meeting was a dinner at which Helen Walsh, President-Elect of the A.D.A., was guest of honor.

Hawaii Dietetic Association. The Hawaii Dietetic Association was organized in April, 1939. At that time Mrs. Bessie Brooks West, who was visiting in the Islands, met with a group of home economists and hospital dietitians and made plans for the organization. In January, 1946, the affiliation with A.D.A. took place.

All during the war the group took an active part in nutrition programs. The members have been active, too, in many community nutrition and vocational guidance programs, and are credited with the following publications: (a) *Cooking for a Crowd*, published in 1945 as a project of the Community Nutrition Section. It contains a collection of recipes in quantities for fifty people. (b) *Home Economics as a Career*, prepared in 1946 as a project of the Professional Education Section in conjunction with the Vocational Guidance Department of the Department of Public Instruction. (c) *The Hawaii Diet Manual*, 1947, a project of the Diet Therapy Section.

At the present, there are thirty-seven members of the Hawaii Dietetic Association, twenty of whom are hospital dietitians. The remainder of the members are employed in the teaching profession, school lunch program, and in public health and community nutrition. Although there are newly created positions in the territorial and city institutions, turnover in Honolulu hospitals has not been great. Many mainland dietitians have come to the Islands seeking positions, only to find that there are not

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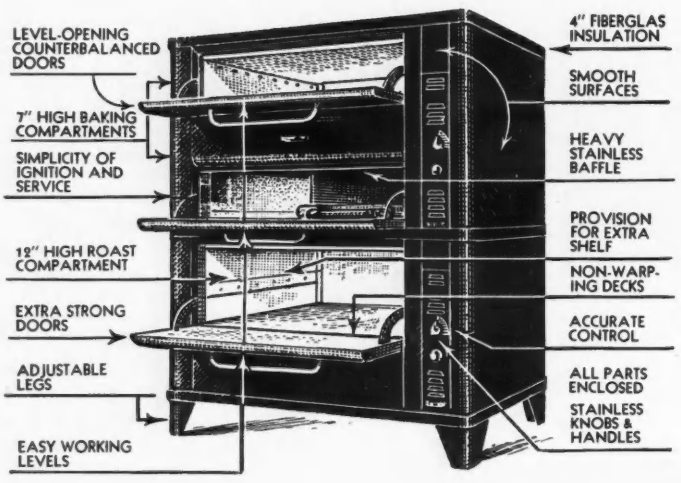

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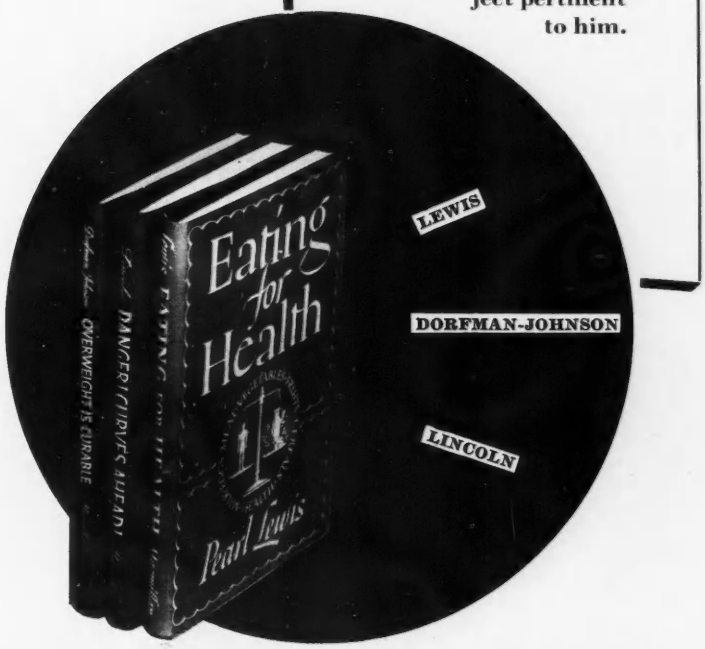

EATING FOR HEALTH

by PEARL LEWIS, B.S., Consultant Dietitian; formerly Dietitian, Kahler Hospital and Hotel (Mayo Clinic), Rochester, Minn.

This book is a study of foods, and their relation to the human body, as well as a plan of Eating for Health. The author explains why the body requires food and which foods contain specific nutrients essential to maintain health. She presents a simple discussion of scientific facts concerning proteins, carbohydrates, fats, minerals, vitamins, and water—telling how these foods are related to the structures and functions of the body. The physiology of the body and a study of nutritional processes is reviewed briefly but adequately. Foods for good nutrition are listed, and dietary plans for normal persons of different age groups are provided. This book will prove must useful to the student of dietetics, nutrition, and home economics.

July **$2.25**

DANGER! CURVES AHEAD!

by MIRIAM LINCOLN, M.D., F.A.C.P., Assistant Professor of Clinical Medicine, School of Medicine, University of Washington.

The person who finds himself or herself putting on weight—will find some sound advice in this book Dr. Lincoln points out how weight can be controlled by eating and how the food of a corrective diet can be good, varied, and tasty. She explains how overeating results from (and, indeed, is even the cause of) certain social and psychological maladjustments. She further explains how emotional problems, anxieties, and frustrations may be more pertinent to solution of the weight problem than the matter of balancing calories, minerals, and vitamins, in the daily diet. She offers complete directions for weight reducing with diet lists and menus. Information contained herein is safe, accurate, and simply worded with many case illustrations.

September **Probably $2.50**

OVERWEIGHT IS CURABLE

by WILFRED DORFMAN, M.D., Practicing Physician and DORIS JOHNSON, Dietitian, Presbyterian Hospital.

This is a study of the causes of overweight, the correlations of appetite and emotional factors, childhood habits, heredity, etc. The authors show the relation of overweight to longevity, heart disease, diabetes, surgical risk, diseases of the digestive tract, pregnancy, and nervousness. The reasons for obesity, its effects, and the methods of treatment are made understandable to those who are overweight. There is a full discussion of normal nutrition and considerable information pertaining to low caloric diets under various conditions. This book offers an intelligible summary of the latest existing medical knowledge on obesity. It should appeal to all who have a real interest in nutrition and its progress and to all who are overweight and who have a sincere desire to lose weight.

October **Probably $2.50**

THE MACMILLAN COMPANY

60 Fifth Avenue
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many available. Dietitians wishing information regarding available vacancies should write to the Director of Dietetics, The Queen's Hospital, Honolulu 9, Hawaii.

Illinois Dietetic Association. The members of the *Chicago Dietetic Association* entertained hospital superintendents, medical directors, and friends at a public relations dinner April 28. Following a Smorgasbord at the Swedish Club, Bonnie Beilfuss, president of the Chicago group, introduced the guests of honor. Speaker of the evening was Dr. Roger W. DeBusk, Executive Director of Evanston Hospital.

The dietetic interns of Chicago have recently formed their own organization. Two interns have been elected from each internship in the Chicago area to form the executive board. Elizabeth Sears, dietitian at Billings Hospital, is the staff adviser. The hospitals represented by this new organization include Billings, Cook County, Michael Reese, and Veterans Administration Hospital at Hines.

Kansas Dietetic Association. A booth was prepared by the Kansas Dietetic Association for the 18th annual home economics Hospitality Days, held on April 17 in Kansas City. Approximately 1650 high school girls and teachers from ninety-four Kansas towns saw the exhibit, which used the theme "Spotlight on Dietetics." The A.D.A. pamphlet "Dietitians in Demand" and the *Kansas City Dietetic Association* pamphlet "Dietetics Now Playing in the Spotlight" were distributed.

The *Kansas* and *Greater Kansas City Dietetic Associations* cooperated in designing a booth for display at the meeting of the Midwest Hospital Association. The theme was "Food—The Foundation of Nations."

The dietetic institute which was sponsored by Margaret Gillam of the American Hospital Association in Kansas City, April 12 to 13, was attended by 106 dietitians and hospital administrators. Representatives came from sixteen different states as well as the District of Columbia. Experts in personnel management, cost control, architecture, and sanitation took part as speakers or as leaders of the discussions. Faculty members from Kansas included L. C. Austin; Sister Bernadine; Margaret Blaylock; Ruth Gordon; Ada Lovett; Charlet B. Newell; Bessie Brooks West, and Norma Jean Winn.

Louisiana Dietetic Association. The annual meeting of the Louisiana Hospital Association and the Louisiana Dietetic Association was held in New Orleans at the Roosevelt Hotel, June 17 and 18. After the Welcoming Luncheon, a joint meeting was held. Addresses were as follows:

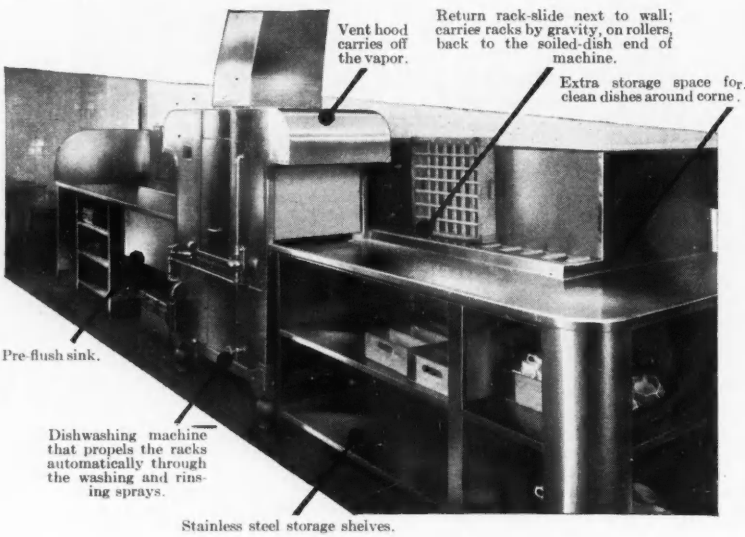
"Organization of Hospital Pay-Cafeterias" by Mary Harrington, Director, Dietary Department, Harper Hospital, Detroit, Michigan.

"Public Relations and Hospital Problems" by C. J. Foley, Secretary of Council of Public Relations, American Hospital Association, Chicago, Illinois.

"Attitudes in Management" by Robert Elsasser, Management Analyst of New Orleans.

At a joint meeting Friday afternoon, June 18, Anna M. Tracy, Director of Food Service, Florida State University, spoke on "This Business of Food." Miss Tracy was followed by Kenneth Williamson, Assistant Director, American Hospital Association, whose topic was "The Hospital's Task Force." Violett O'Reilly, Principal of the L. E. Rabouin Vocational High School, New Orleans, spoke on the subject, "Are We Ready?" Antone G. Singsen, Assistant Director of Blue Cross Plan Commission, Chicago, spoke on "Blue Cross—Hospital Relations." In the evening an informal banquet completed the annual meeting.

Minnesota Dietetic Association. Plans were made by the Minnesota Dietetic Association to display their vocational guidance exhibit at the Minnesota State Fair, August 28 to September 6. The pamphlet, "Dietitians in Demand" was distributed at the same time.


Vent hood carries off the vapor.
Return rack-slide next to wall; carries racks by gravity, on rollers, back to the soiled-dish end of machine.
Extra storage space for clean dishes around corner.
Pre-flush sink.
Dishwashing machine that propels the racks automatically through the washing and rinsing sprays.
Stainless steel storage shelves.

Are you planning to install **MODERN Dish Washing Equipment?** Study this picture—

—you'll see some of the best recent improvements: Return slide for racks . . . Pre-flush sink . . . Plenty of storage space, utilizing the corner and stainless steel shelves . . . Atmosphere kept clear . . . and a dishwashing machine that *propels the racks through automatically*, assuring correct timing of the wash and rinse. We also build Belt Conveyor and Door Type machines . . . a complete line, to meet any needs. Write for the Champion catalog.

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These delicious new dehydrated fruit juice flavors are developed by a new and exclusive process and are **Easy to Prepare**—just add water and sweeten.

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Pennsylvania Dietetic Association. The *Philadelphia Dietetic Association* has made plans for its projects of the coming year. The general plan followed during the past year will be developed further. The Diet Therapy Committee has selected twenty-four members to carry on its work. The committee will continue the classes of instruction for diabetic patients at the County Medical Building. They will also prepare low-cost diets for the Health and Welfare Council and will work generally to improve methods and means of contact with the medical profession and allied medical groups by offering assistance with dietary problems.

The Administration Section has four definite aims for the coming year: (a) to work on an outline for training of students at the Dobbins Vocational School; (b) to plan part of the program of the Food Institute Day for next year; (c) to give special attention to methods of helping administrative dietitians in the immediate area with their current problems; and (d) to collaborate with the Professional Education Section on courses to improve the status of the administrative dietitian. Advisers for this project are Evelyn Carpenter, Elizabeth Miller, and Margaret Heubert.

The Professional Education Section has made plans as follows: (a) to continue with the questionnaires which will be sent to members to secure information on the dietitian's need for refresher and credit courses in local colleges and universities; (b) to work with the Diet Therapy Committee on classes and instructional material; and (c) to plan a comprehensive program for the Section meeting.

The Community Nutrition Section will make plans with the Health and Welfare Council for working in an advisory capacity with the community nursing homes in the Philadelphia area. The Section will also cooperate with the Diet Therapy Committee on developing low-cost diets, and will plan an inclusive Section Meeting.

The Publicity Committee, which is in charge of public relations, will publicize the activities of the Diet Therapy Committee. Already arrangements have been made for two fall radio interviews. In addition, a radio program to take place in the spring has been planned for the Vocational Guidance Committee.

Tennessee Dietetic Association. Members of the *Memphis Dietetic Association* were given space in the Memphis Dairy Council Booth during the Mid-South Food Show. The leaflet, "About Dietitians," compiled and mimeographed by the Memphis group, was distributed along with "Dietitians in Demand." Dietitians and dietetic interns participated in making the exhibit a success. A three-panel screen at the back of the exhibit table listed opportunities for girls in dieteties and showed pictures of some of the dietetic interns from Kennedy Hospital at work and at play. Also displayed was a map showing the locations of dietetic internships throughout the U. S. To supplement this publicity for the profession, arrangements were made with one of the radio stations for spot announcements telling of the opportunities in the field of dietetics. Another station carried an interview which featured Edith Graham, Chief Dietitian at Kennedy Hospital, and one of the dietetic interns.

The vocational guidance program in Tennessee is not limited to Memphis. Contacts with schools, guidance workers, radio stations, and newspapers are being made by members in Chattanooga, Knoxville, Cookeville, and Oak Ridge.

Association Activities

***Mademoiselle* Points Up Dietetics.** In the Jobs and Futures News column of the July issue of *Mademoiselle* the opportunities for a career in dietetics are enumerated. The suggestion is made that girls interested, write to the office of the A.D.A. for a copy of *A Bibliography of Dietetic Careers*. An excellent response to this suggestion has been received, and the A.D.A. office has sent out a number of Bibliographies, along with our other free vocational material.

Today's modern methods of caring for babies are typified by this sanitary, well regulated hospital nursery.

Back in 1847 when Van was established, these old-fashioned incubators were kept warm by adding hot water to warming tanks.

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(Institutions, Restaurants, Armed Forces, Hospitals)

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Canned Foods Recipes
SCHOOL LUNCH RECIPES USING CANNED FOODS
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CANNED FOOD TABLES
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✓ ***If yours is a QUANTITY FOOD preparation problem, send for:***

"Canned Food Recipes for Serving Fifty" A 64-page book crammed with tested recipes, new ideas, time-saving preparation methods *plus* a whole section on menu planning! Recipes developed and tested under special grants in the Institutional Divisions of the University of Washington and Kansas State College, Manhattan, Kansas. Sorry, this book is not available for student distribution.

✓ ***If yours is a SCHOOL LUNCH service problem, you'll want this Triple-Help School Lunch Kit!***

(a) "School Lunch Recipes Using Canned Foods" Pattern menus—recipes in servings of 25 and 50. Wonderful aid in ALL school lunch preparation. Special sections of recipes for Type A and Type B lunches—with recipes accurately computed to fulfill government nutritional requirements.

(b) "Quantity Recipes Using Canned Foods" Handy as can be—a supplemental handbook of tested recipes serving 50.

(c) "Canned Food Tables" Helps you quick-check vitamin content of canned foods—gives you a chart form of servings per can.

Note: *A limited number of School Lunch Kits are also available for Senior College students in Institutional Management.*

We repeat—JUST ASK for these aids!

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PLEASE SEND ME THE FOLLOWING MATERIALS:

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More Aid to Foreign Libraries. Since the report of the work of the Professional Education Section committee on "Assistance to Libraries in Needy Countries" was made in the July issue of the JOURNAL, information has been received from several more state and local associations. The following reports indicate the progress that is being made:

Wisconsin and Milwaukee Dietetic Associations have written to seven libraries in Greece, China, Manila, Italy and Poland asking if they would like subscriptions to the *Journal of the American Dietetic Association* and *Nutrition Reviews*.

West Virginia Dietetic Association: "We would like to have the address of a protégé." As a result of this request, the association has been sent the addresses of libraries in Germany and China.

Also of interest in this regard is the special project which has been assumed by the School of Home Economics and the World Student Service Committee of the University of Massachusetts. These groups are giving assistance to the organization of the first college home economics department in Poland. In addition to donating $1000 for equipment and collecting textbooks and clothing, these organizations sent a complete file of our JOURNAL. Another complete file of the JOURNAL was sent to the Lester Institute in Shanghai, China.

Conference on Citizenship. Jennie Barton Nichols and Emma Hall were the A.D.A. representatives at the Third National Conference on Citizenship, held in Washington, D. C., May 16 to 19. On Monday, May 17, the general topic for discussion was the "World-Minded American Citizen." Tuesday's discussion was devoted to "Basic Human Rights and Attendant Responsibilities." On Wednesday attention was given to the subject, "Citizenship in Action in the Local Community." In addition to the group discussions, addresses on the various aspects of citizenship were given by Attorney General Tom C. Clark, Carl B. Hyatt, and other prominent persons active in the citizenship program.

Radio Broadcast on Dietetics. A radio script featuring the dietitian has been prepared by the American Red Cross. Records have been made and distributed to radio stations throughout the country. The program was used by some stations during the month of August; other stations will feature it during September.

News of Advertisers and Exhibitors

The *Detroit-Michigan Stove Company* has announced a complete new line of heavy duty ranges and attachments. Models in the new line, known as the 45–29 Series, include ranges with all hot top, open top, and fry top, all with or without ovens. New features include Flo-Line Design, larger Even-Temp oven, loop style oven burner, a new system of flue ventilation, new Dura-Bilt oven heat control, and new type Under-Lock high shelf brackets. Attachments too have been redesigned. Matching companion units include a new combination griddle and broiler and a new deep fat fryer.

Announcement has been made by the *American Can Company* that 78 per cent of the natural rubber formerly used in can manufacture has now been replaced by man-made rubber such as buna-S and butyl. The rubber is used in the form of "sealing compounds" which are folded invisibly between layers of compressed metal around the top and bottom rims of all air-tight cans. Although natural rubber was used exclusively before the war, the new synthetics have proved so much better that natural rubber is now used for only a few specialized kinds of sealing compounds.

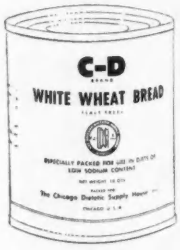
A new leaflet has been published by the *Borden Company*, giving recipes in which the product, Starlac (dry skim milk), can be used. Recipes for main dishes, milk drinks, and desserts are included.

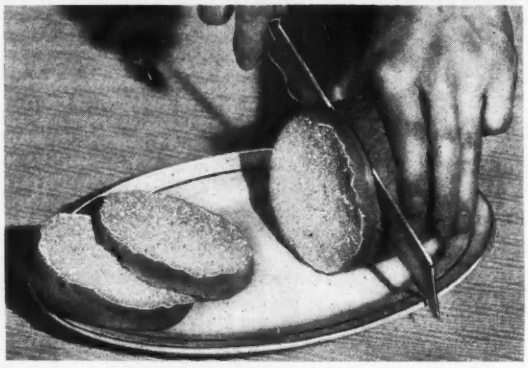
Now available throughout the U. S. are the following baby foods put out by *Gerber Products Company:* strained and chopped veal, liver, and beef. Better color, flavor, and quick separation of meat into particles suitable for infant diets are claimed for the product through the use of a process now being patented. These meats are the product of the collaboration of the joint research staffs of the Gerber Products Company and of Armour and Company, who supply the meats. Professional reference leaflets are available through the Nutrition Department, Gerber Products Company, Fremont, Michigan, together with reference cards giving nutritive breakdowns of the products.

A booklet entitled, *Use of Fresh Citrus Fruits in Hospitals and Other Institutions*, has been prepared by the *California Fruit Growers Exchange*. The four sections of the booklet are as follows: Section I. Suggestions for the Administrative Dietitian; Section II. Suggestions for the Dietitian Who Feeds the Personnel; Section III. Suggestions for the Dietitian Who Feeds the Patient; Section IV. Suggestions for the Dietitian Who Teaches. Quantities of the booklet are available; they may be obtained by writing to the Nutrition Research Division, California Fruit Growers Exchange, Box 5030 Metro. Station, Los Angeles 55, California.

The new Vulcan Flavorizer, manufactured by the *Standard Gas Equipment Corporation*, is now available for commercial installations. The machine is designed to permit large and speedy food production in a very limited area. It is 28½ in. square and 69 in. high. It is fabricated almost entirely of high finished stainless steel and polished aluminum with four large windows of heat

For the LOW SALT DIET





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For the cardiac patient, and others whose sodium intake must be limited. C-D WHITE WHEAT BREAD is a yeast bread, prepared without the use of salt or milk. Baked in tins and sealed as soon as it leaves the oven, to protect freshness and flavor. Natural sodium content: 0.024%

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Q: Which bread helps you solve the greatest number of dietary problems?

A: ***Ry-Krisp—the crisp whole-rye wafer, has many dietary uses. For instance—***

Ry-Krisp—in obesity diets
Only 23 calories in each double-square wafer. Yet Ry-Krisp supplies the protein, minerals, and B complex vitamins of whole-grain rye. Ideal bread in low-calorie diets.

Ry-Krisp—in allergy diets
Contains only whole-grain rye, salt, and water. A safe, unleavened bread for patients sensitive to wheat, milk, eggs.

Ry-Krisp—as a corrective for common constipation
Ry-Krisp's whole-rye bran and regulating minerals make it a natural corrective when insufficient bulk is the cause of common constipation. Its high percentage of unavailable carbohydrates further encourages normal elimination.

Ry-Krisp—to stimulate teeth and gums
Crisp, crunchy Ry-Krisp provides exercise teeth and gums need.

Ry-Krisp—as an ever-ready every-meal bread
A tempting addition at mealtime. Ry-Krisp is airy-textured, light, golden-crisp. Wax wrapped to prevent loss from staleness. Ry-Krisp *keeps* crisp!

FREE TO YOU

Reducing Booklets: "Design for Reducing." Contains 1200-calorie diet for women, 1800-calorie diet for men. "Through the Looking-Glass." Provides 1500-calorie diet for overweight teen-agers. Both booklets contain menus, special recipes.

Allergy Diets, Eleventh Edition: A booklet for your files containing single copies of Wheat-free, Egg-free, Milk-free, Wheat-Egg-Milk-free and Restricted Diagnostic Diets. You may order free diet pads as you need them.

RY-KRISP SPECIAL
9-Lb. Institutional Package Economical
...four wafers cost about one penny!

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Please send, no cost or obligation:
..... copies of C566, "Design for Reducing."
..... copies of C966, "Through the Looking Glass."
..... C2143, Allergy Diets booklet.

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Make Your Patients' Thanksgiving Trays More Cheerful

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Strike the holiday note with decorative, cheerful Thanksgiving paper tray appointments. Attractive matching designs in napkins, tray covers and Dessert Doilies add a festive note to meals for shut-ins.

Bright, cheerful surroundings do much in speeding a patient's recovery. Aatell & Jones holiday and Sunday paper tray appointments, through their lively and colorful designs, lift patients' morale. They mean more sanitary service, too, with a clean new tray cover for each serving.

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resistant glass to permit constant viewing from all sides of the food being prepared within the cooking chamber. Food is placed on food holders which are inserted in a slowly revolving platform. Because of the efficient distribution of the heat, many common foods require sharply reduced preparation time.

Standard Brands has introduced a new product, Instant Tender Leaf Tea. This soluble tea dissolves instantly in cool water and can be used successfully either iced or hot.

General Mills' recently released film, "The School That Learned to Eat," was honored in August by being selected for showing at the International Film Festival in Edinburgh, Scotland, as the "best documentary film in education." The film deals with the nutrition education work which General Mills has helped to promote for the last three years in East Griffin, Georgia, and emphasizes the part played in building up good eating habits by the school lunchroom. It is now receiving national distribution.

Cereal Institute, after a study of food costs, has announced that breakfast can supply one-third to one-fourth of the daily food requirements at considerably less cost than other meals. A basic breakfast, as approved by the Department of Agriculture, was estimated by the Institute to cost 15 cents in comparison with a luncheon costing 39 cents and a dinner which costs 53 cents. The 15-cent breakfast would include 4 oz. orange juice, 1 oz. cereal, 4 oz. milk for the cereal, 1 tsp. sugar, 2 slices of toast, 1 tsp. butter, and 8 oz. milk. It was also pointed out that the cost of foods for such a breakfast has remained fairly stable over the last year, while the cost of foods for other meals has risen.

Igleheart Brothers, Inc., a division of *General Foods Corporation*, has put on the market a Swans Down Instant Cake Mix. With this new mix, a white cake can be made by merely adding milk, mixing, and baking. Other types of cake can be made from the new mix by adding chocolate, coconut, or nuts.

On June 22, a new range plant for *Hotpoint, Inc.*, was dedicated. The new plant is equipped to produce 12,000 ranges weekly, and the first year's output is expected to triple prewar production. Many new technical advances have been incorporated in the new plant. Four separate assembly lines make it possible to manufacture different models simultaneously. For the dedication ceremony and Open House held for Hotpoint employees and their families, the first electric range built by George A. Hughes, founder of Hotpoint, was borrowed from the Detroit Museum for display.

Diet and Old Age

The object of nutrition research is to discover diets that will maintain health and productivity throughout the longest possible life span for man and his domestic animals, according to Dr. Clive M. McCay, Professor of Nutrition at Cornell University. Speaking on the subject of old age at the Seventh Annual Conference on Conservation, Nutrition and Health, sponsored by the Friends of the Land at Ohio University, Dr. McCay pointed out that modern civilization has left us with new problems. Last year there were more than two million people in this country getting old-age assistance and ten million of our citizens were classified as aged. In view of the fact that the female experimental animal outlives the male just as women outlive men, the question was raised as to why American women have shown so little interest in the problem when every married women faces an estimated widowhood of eight years.

It was also pointed out that lime seems to be lost from the body in old age when the diet contains only a moderate amount. This is probably due to the fact that older people tend to consume more baked products, such as bread, because they are cheap and more easily chewed than many other foods. The income of the aged is often meager and makes impossible the purchase of much protein in the form of meat, milk, and eggs. Dr. McCay and his associates are trying to teach the public that it should buy bread containing 6 per cent of dried milk solids and 6 per cent of high-fat soy flour. They point out that if the public buys its bread on a basis of cheapness alone, it is actually losing money because the baker is forced to use low-quality ingredients and omit milk.—*From New York Times, July 4, 1948.*